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CATCHING'S COMPENDIUM

—OF—

PRACTICAL DENTISTRY

FOR 1890.

B. H. CATCHING, D.D.S.,
EDITOR AND PUBLISHER.
ATLANTA, GA.

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TO THE DENTAL EDITORS

THIS WORK IS MOST RESPECTFULLY DEDICATED.

PREFACE.

I present this work to the Dental Profession with no small degree of pleasure, believing it will be of benefit to the progressive practitioner thereof. The work of gleaning from the thousands of pages of good matter offered by our journals has not been an easy one. In this labor I have been guided by nothing but a desire to benefit dentistry. The Dental Profession has cause to feel proud of its current literature. Eight years of journalistic work did not reveal to me its superiority as has this one year of compiling its practical productions. Those who will most appreciate this work are those who appreciate most the current literature of their profession. Year by year the succeeding issues of this book will show the steady progress made in dentistry.

To that end we should all work.

B. H. CATCHING.

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OPERATIVE DENTISTRY.

PULP, DESTRUCTION, REMOVAL AND ROOT FILLING.

DR. A. W. HARLAN.

Dental Review.

The destruction of the dental pulp in a permanent tooth is a foregone conclusion after a loss of a portion of its substance, by exposure, or it has been long irritated or inflamed and congested, from near or total exposure to external agencies. This general statement may be made with a few minor exceptions, as for example, after the fracture of a tooth where a portion of the crown is lost by accident, or the exposure of a pulp in an incompletely developed tooth, in such cases attempts should be made to preserve its vitality, as well as in all cases where it may be accidentally uncovered in excavating a cavity. Otherwise than these exceptions, the general rule may be as stated above. When the pulp is to be destroyed, the cavity of decay should be bathed or syringed with warm water, 110° F to 130° F. The crown, if there be sharp corners, should be trimmed with chisels, or in any way most familiar to the operator. A little square of rubber dam, two inches or thereabouts, should be slipped over the tooth and the one adjacent (if it be present), and the pulp is then exposed, and vinum opii or any anodyne applied (not carbolic acid) for a minute or two. After which use the following:

℞ Acidi Arseniosi ..... ℥ i
Hydrochlorate of cocoaine ..... ℥ij
Lanolin ad. q. s. to make a stiff paste.

A small quantity should be applied directly to the exposure on a little square of gummed paper about $\frac{1}{16}$ of an inch in size. This should be covered with a pellet of cotton dipped in liquid vaseline and the cavity is then to be stopped with soft gutta-percha, or if there be time enough, a paste of oxyphosphate of zinc may be used. If the patient is an adult (more than 21 years of age) the

arsenical application should remain 48 hours. If under that age and more than 12 years, 24 hours, under 12 years, 8 to 12 hours is long enough. When the patient returns at the appointed time the little square of rubber-dam is reapplied and the dressing removed, water and saliva must be excluded from the tooth. Nothing should be placed therein unless the operator uses it himself. Apply to the cavity immediately a pellet of cotton saturated with dialysed iron to antidote any arsenic adherent to the pulp or the cavity of decay. The first thing to be done then and there is to puncture the pulp with a fine sharp-pointed instrument. A little blood will escape which is carefully wiped out. Apply some peroxide of hydrogen on cotton with nickel-plated, platinum or gold pliers until the blood is destroyed. Gently wipe the cavity with oil of cassia, absorb the excess with paper or lint and then apply directly to the pulp a square of paper fiber-lint, wet with a saturated solution of tannin in glycerine, cover this with gutta-percha, or if the pulp appears to be still sensitive, apply at the same time a pellet of cotton saturated with myrtol, then seal the cavity with gutta-percha, and make two perforations through it with a pointed instrument not larger than an ordinary steel or brass pin. Dismiss the patient for eight days.

At that time everything is favorable for the complete removal of the pulp. It may be removed entire from the root or roots and immediate root filling may be practiced. Before this is attempted the following precautions must be observed: No water or saliva should be allowed to gain access to the pulp chamber or canals, as this would be fatal to the maintenance of the color of the tooth. Complete desiccation of the canals should be undertaken because on its faithful performance the future stability of the tooth depends. This may be accomplished in several ways. First, heat from an electric or other cautery. The Evans or Woolley root dryers may be used. Second, by the rapid evaporation of chloroform. Third, by the use of boro-glycerine or aqua-ammonia, and fourth, by using absolute alcohol to excess, that is by filling the pulp chamber and canals with absolute alcohol and dissipating it with hot blasts from a syringe and repeating this until absolute dryness is secured. When this is accomplished, filling of the root at the same sitting is indicated; nothing will be gained by deferring this operation. Filling of the root is made possible in the following manner: Eucalyp-

tol is introduced into the root on cotton or otherwise, and after the excess is absorbed with paper cones, a creamy solution of gutta-percha in chloroform is pumped into the roots until they appear to be well filled. Then slender cones of gutta-percha are introduced into the root by heating a fine broach which is thrust into the large end of the cone and carried directly to the apex.

TREATMENT OF TEETH HAVING FOUL PULPS.

DR. A. RETTER.

Dental Cosmos.

I will not divide this class of teeth into several classes, according to the condition they are in at the time we receive them for treatment, but simply claim that whatever their condition may be, whether they are sore or not, with swelling, or perfectly quiet at the time a dead pulp is diagnosed, the first effort to be made is to open into the pulp-chamber and root and to remove the cause, which is the decomposed tissue in the canals and dentinal tubuli. Even where there is a certainty of pus and a fistula sure to form, the opening into the pulp and its removal will render the forming of a fistula less painful and limit its area; and quite often, if proper local and systematic treatment is resorted to, it will prevent a fistula altogether, and the tooth or root may be restored to a comparatively normal condition without useless destruction of tissue. If the tooth is sore and very painful to be operated on, then a sharp drill, a smooth-running hand-piece on the engine, the steadying of the tooth by the fingers or other mechanical aid, or the local application of cocaine, will aid greatly in accomplishing the object. In such sore and painful cases it is better to simply wash out the pulp chamber, pass a fine broach into the canals to facilitate the escape of gases, and then if there is merely pericemental inflammation it may be reduced by the persistent local application of tincture of iodine and aconite, or iodine and cocaine, or the Darby pepper plasters. If there is a large swelling with pus at the end of the root, so that a fistula is desired, the drilling through the alveolus will give quick relief. However, I hardly ever have to resort to this method, and would only do so with anterior teeth, or

when I feel certain of striking the sac. With posterior teeth, reaching the sac is uncertain, and, in failure, is accompanied by increased pain and destruction of tissue; then the pepper plasters and systematic treatment will aid promptly, reducing the pain, and often cause a resolution without a fistula. The systematic treatment consists in the administration of chloride of ammonium, a teaspoonful to a glass of water, and out of that a tablespoonful every two hours till the face becomes flushed. It is a refrigerant and powerful resolvent and alterative. Iodide of potassium in doses of five to fifteen grains, three times a day, is also a valuable remedy, it being likewise a powerful resolvent and alterative. I use it especially where there is much pus. In simple pericemental inflammation, fluid extract of veratrum viride, a drop every hour till seven drops are taken, will prove valuable. Internal remedies are a powerful aid in these affections, and their use and administration should be carefully studied.

My aim is always to first restore the tooth and the patient to a condition to be operated on. As soon as this condition is established, the more thorough removal of the septic matter in the canal and dentinal tubes is commenced. To do this effectually the rubber dam should be applied whenever possible. Having removed whatever more solid remnants there may be, wrap a few fibres of cotton or silk around a broach, and then repeatedly wipe or mop out the canal with a strong solution of ammonia, which aids in the desication of the septic contents of the canal and tubuli. It must be remembered that the septic matter is not only in the root canal, but in the dentinal tubes. To remove it from or destroy it in these tubuli it must be reached by imbibition of fluids which will change its character so it can be more readily washed out or subsequently affected by the germicide used. Corbonate of sodium packed into the pulp chamber and root canals and left for a day, well sealed in, will also accomplish this object. Indeed, I believe it to be one of the best applications at this stage of the treatment, and I have the best success from it. It saponifies and renders soluble the septic contents so that they may be readily washed out with hot water and made ready for the dressing with a germicide. No substances which have the power to coagulate albumen should be used at this stage, for such action prevents the ingress or penetration of a germicide, as well as the escape of septic matter and its gases. A

tooth may become well by their use at this stage of treatment, but if it does it is in spite of such unreasonable treatment, and not on account of it. The washing with ammonia or the carbonate of soda treatment I invariably follow up with another thorough injection of peroxide of hydrogen. This agent is of especial value in blind abscess or pus at the end of the root.

Having thus removed the septic contents as thoroughly as possible, dry the cavity carefully with hot air injected under pressure of from thirty to fifty pounds. For this purpose I have an air-receiver into which the air is pumped. From this it passes through a hot-air syringe. I dry the tooth thoroughly, and often am astonished at what an amount of odor is expelled, even after the most thorough and painstaking washing and mopping of the canal. I consider this hot-air treatment as the best means to be employed at this stage. Where a fistulous opening exists, it will force the pus clear through it better than anything I have ever seen, and it will also force the medicines clear through. Where there is no fistulous opening, it will drive the medicine to the points wanted. It will dry a tooth thoroughly and quickly, and put it in the best condition for the reception of the germicide dressing.

The dressing to be next applied to the tooth consists simply of cotton steeped or soaked in a strong solution of hydronaphthol in absolute alcohol. It is almost odorless, and being perfectly soluble in alcohol, will, when placed in the tooth, penetrate into the tubuli on account of the affinity of the alcohol for water, thus abstracting the water from the contents of the tubuli and thereby robbing germ-life of one element of its existence, which is moisture. Perchloride of mercury in combination with tartaric acid, so as to prevent the formation of albuminates, is also a favorite dressing. I do not like to use it in the anterior teeth, for fear of subsequent discoloration; however, where this is not to be feared, it is beyond doubt the most powerful germicide that can be applied. It also has a strong affinity for water—a valuable quality for a canal-dressing. Iodol dissolved in alcohol is another good dressing, and indeed, the antiseptics for this purpose are multiplying rapidly. It must be observed, above all, that it is not alone the drug that is employed that brings the effect, but the manner in which it is applied. Thoroughness is essential.

The dressing being applied, the tooth is sealed with gutta-percha and the patient dismissed for a week or more. If severe pain should ensue in spite of additional systemic treatment, open the tooth again and wait a few days and then repeat the process. It must be borne in mind that in some constitutions the vitality is low and nature does not repair so readily, and though you may drown the tooth in germicides, though you may fill the roots ever so completely, in such depraved organisms at every depression they undergo, a pulpless tooth is at any time liable to brew trouble.

If, after the dressing has been applied for a time, no trouble ensues, and on removal of the dressing no odor is perceptible, the tooth or root can be filled.

Of course, this reasoning does not apply to teeth that have never been inflamed or where the fresh pulp has been removed.

The after-success and comfort of teeth thus treated depends largely on the care and choice with which the roots shall be filled. Up to this stage I have avoided clogging the tubuli. Now I desire a material that will go to the end and soak into the tubuli as much as possible, and for this purpose I prefer two agents. The first is oxychloride of zinc, provided the canal is large enough to permit of its successful working. This material, from its affinity for moisture, will penetrate deeply and persistently into the tubuli, coagulating whatever tissue may be in them and rendering them non-decomposable. The second is a strong solution of hydronaphthol in alcohol, in which shellac is dissolved till it forms a thick paste. This material can be worked into the fine buccal root-canals, too fine to be drilled. It can be pumped clear to the apex with safety, and has proved itself an excellent filling material for this class of roots.

CAPPING PULPS.

DR. J. N. CROUSE.

Dental Review.

I cap the pulps of all teeth when the dentine is sensitive; that is, when it responds to scraping of excavator and gives off sensation, which I believe to be one of the best tests of a healthy pulp. I apply carbolic acid freely, getting a complete coat of

coagulated albumen over the point of the exposure, cap with oxychloride, being very careful to apply the capping in a skillful manner, believing it to be one of the most delicate operations in dentistry, and being sure to have a good solid base for the cap to rest on, having removed sufficient of the softened portion to make sure that the cap rests solid, and filling over this with whatever material seems best for the permanent filling.

HEAT APPLIER.

DR. GILLETTE.

Archives of Dentistry.

Talc or soapstone points, in an ordinary crayon holder as a handle, I find very useful as a means of applying heat to hasten the setting of cements in crown-work, and whenever cement is used, also as an aid in diagnosing dying pulps, etc. The mass of soapstone when heated to a proper temperature, retains the heat much better than steel instruments. The points are readily shaped to any desired form and size with a vulcanite file and sandpaper.

PREPARATION FOR CEMENT FILLING.

Southern Dental Journal.

Before filling teeth with any of the preparations of cement, wipe the cavity out with aromatic sulphuric acid; full strength. This, by removing any trace of oils which might be present, causes the cement to adhere with great tenactity to the walls of the cavity.

MANIPULATION OF COPPER AMALGAM.

DR. G. V. AMES.

Dental Register.

Great care should be used in heating. Better results are secured when it is exposed to a slow heat. It should never be heated until it turns blue or brown. When sufficiently softened, place in a mortar that has been previously heated to about 110 degrees,

crush and triturate thoroughly, after which manipulate it with the fingers lightly and rapidly in the palm of the hand; then place the material in the warm mortar and use warm instruments for packing, having first used warm air for drying the cavity, if practicable. When full, smooth off with wet bibulous paper and leave the polishing for a subsequent sitting. I sometimes cap the copper with gold, and know of no objection to the practice. Of late I have been adding gold to the filling while soft by rubbing No. 4 cohesive gold foil into it with a hot burnisher, being careful not to have more than one thickness of foil under the burnisher at one time. Such fillings retain their color, but do not receive as fine a finish or have as much edge strength as the copper alone. When using copper amalgam I do not use varnish on the interior of cavities, as I believe the chief virtue of copper amalgam is in the formation of an oxide or a sulphide, either of which is an excellent and durable antiseptic. For this reason the pulp will tolerate its near presence better than that of any other alloy; it is also less susceptible to thermal changes.

ROOT FILLING, IMMEDIATE.

DR. F. M. SMITH.

Archives of Dentistry.

The patient presenting will have, for instance, an upper canine or bicuspid tooth; it has been filled, but for some cause the pulp has died. There is every evidence of inflammation, congestion, and, if you please, suppuration; the tooth being so sore that the patient can scarcely bear to have it touched.

If in this sore condition, I at once drill into the pulp cavity from the most convenient point, in order to relieve the suffering and dismiss my patient until the soreness is gone. The following day, open the tooth thoroughly, always applying the rubber dam before commencing to operate. Pus may escape, but that does not matter. After the flow of pus and blood has ceased, if the canal is small, enlarge it with a Morey or Gates Glidden drill, sometimes going to the apex, but usually only one-half or three-fourths of the way up, after which take a broach or nerve bristle without barbs or hook, and pass it through the foramen, which can usually be done if the

foramen is sufficiently large to allow pus to escape. At any rate, I get through the foramen, if I have to drill through. This accomplished, if the foramen is large, measure the length of the tooth, from the cutting edge to the end of the root, after Dr. Atkinson's plan of passing a nerve instrument with a very fine hook on the end, through the foramen, having previously placed a small piece of rubber dam on the shank of the instrument, and having hooked it outside of the end of the root, I move the rubber up to the cutting edge, then carefully withdraw, when I mark the length on the instrument, or on a piece of wood, with a sharp lead pencil, and take good care that I do not lose it.

After thoroughly washing the root out with warm water, and drying it carefully, force a ten per cent. solution of chloride of zinc through the foramen, and the patient lets me know when it is through. This being accomplished, the root is again thoroughly dried, and then filled with the following mixture: gutta-percha dissolved in chloroform, to about the consistency of cream, and forty to fifty grains of powdered iodoform is added to each ounce of gutta-percha solution. This should be stirred each time before using, as the iodoform is only slightly soluble in chloroform. To get this mixture into the root is not the easiest matter in the world, as all know who have tried a solution of gutta-percha; but it can be done. If you are in a hurry and do not take sufficient time to do this well, then it is a waste of time to do it at all.

A few suggestions may be of value in this connection. Supposing the canal to be moderately good-sized, and an enlarged foramen. In that case, take a piece of orange-wood, whittled to a point, that will reach to the end of the root (here you have use for your measure), wrap a few fibres of cotton securely around it, twisting it between the thumb and finger. Being sure the root is dry, dip the stick and cotton in the mixture, getting it well filled; then pump it up to the end, no matter if a little goes through. Next, take a very small piece of gutta-percha, roll it between the fingers (after heating) to about the size of the enlarged foramen; warm the end of a canal plugger and place the piece of gutta-percha upon the end. Measure from the gutta-percha upon the extreme end, and after dipping the gutta-percha in the solution, quickly carry it to the apex, being guided by the mark made on your plugger. Repeat this as often as necessary, until the root

filling extends down as far as you desire; although the last piece need not be dipped in the solution, but softened by heat. Fill the cavity permanently, if you choose, and dismiss your patient, telling him that the tooth will probably ache badly for five or six hours; and, unless your experience differs from mine, you will have no further trouble with that tooth.

There may possibly be a little soreness the next day, but this is not usual; and an application of aconite and iodine, or a concentrated preparation of iodine (made by dissolving iodine crystals in officinal iodine) will settle it.

Should the root upon which the operation is to be performed have given no trouble, and the patient not remember to have had any pain in it, there will be no necessity for forcing the zinc chloride through the foramen. However, I believe it safest to get a fine nerve bristle through the foramen; then, after drying, force carbolic acid (full strength) up into the root, which can be very thoroughly done, even in small roots, by means of an orange-wood point, whittled very fine and dipped in the acid, pumping it up and down a number of times. For filling these small roots, it is my practice to pump the gutta-percha preparation up into the root with a fine wood point; then take another piece, whittled so fine that it will reach almost, or quite to the end, dip it into the solution, and force home. If the wood does not reach the extreme end, the chances are that it has crowded the solution ahead, so as to thoroughly fill it. In canals of moderate size, the preparation can be carried on shreds of cotton or bibulous paper. It is not material how we convey the filling, so we get it to the apex and thoroughly fill the root.

GOLD CARRIER.

DR. L. P. BETHELL.

Ohio Journal Dental Science.

A very thin piece of steel, about a quarter of an inch square, fastened at an acute angle to a small handle, makes an excellent instrument for carrying folded gold down to cover the whole proximal surface of a filling in the anterior teeth where applying it successfully with pliers is not admissible.

ASBESTOS IN LARGE SENSITIVE CAVITIES.

DR. L. F. KELLOGG.

Dental Review.

In large sensitive cavities, where I purpose filling with amalgam, I cut pieces of asbestos paper of the proper size, touch one side of the pad to sandarac varnish and place it in the cavity; piece after piece is added until the required depth is obtained. The amalgam is then put in.

EXTRACTING ROOTS.

DR. W. BUZZELL.

Ohio Journal Dental Science.

Fragments of roots broken off in extracting, can often be easily removed by burring away the alveolar process immediately surrounding them, thereby avoiding much pain and laceration. It would be an advantage if the dental instrument makers would make some burs with long shanks for this purpose.

PAINLESS PULP EXTRACTION.

DR. COLLINS.

Items of Interest.

Put on the dam, cleanse the cavity, put into it crystal cocaine, touch it with enough water to moisten, leave ten minutes, extract the pulp.

GUTTA-PERCHA FOR ROOT FILLING.

DR. A. W. HARLAN.

Dental Review.

The best method of using gutta-percha is as follows: After the root is ready for filling, which presupposes that it is dry, introduce eucalyptol, which is diffusible, and in which gutta-percha is slightly soluble. In a few minutes the excess of eucalyptol is wiped

out with fine-pointed cotton cones, and then a solution of gutta-percha in chloroform is pumped in. This will permit the spreading of the material into all the apertures opening on the root-canal. The cones are not heated, but a pointed instrument which is heated, is inserted in the large end of the cone, which is then inserted and the gutta-percha is spread and diffused all through the root.

STRENGTHENING FRAIL ROOTS.

DR. H. H. JOHNSON.

Southern Dental Journal.

In filling teeth or roots of teeth in which the walls have been punctured either with a drill or from decay, take a piece of pure gold rolled very thin, form it in the shape of a small cone the size of the canal to be filled; push it, small end first, as far up the canal as you can, then with a smooth, tapering instrument burnish carefully against the walls; after which, fill with cement, packing it in very hard so as to force the sheet of gold against the walls, making a close adaptation. Roots which are so badly decayed as to have several openings in the sides, can be filled in this way with perfect success.

ROOT FILLING.

DR. W. W. ALLPORT.

Archives of Dentistry.

The first thing, after the pulp is removed, is to get rid of as much of the contents of the tubuli as possible. For this purpose there is nothing better than heat. Dry the tooth with the hot-air syringe and then pass up a root-drier, after which treat the root antiseptically. I am in the habit of filling always with oxychloride of zinc, because of the antiseptic character of the chloride. It will prevent further decomposition as far as anything I know of. If the dentine is made perfectly antiseptic, a point which is too often overlooked, no further trouble need be apprehended. In cases where the pulp has been long dead, and the tubuli are filled with

dead and decomposing organic matter, I inject peroxide of hydrogen, drying the root thoroughly first. The peroxide will reach it readily and drive it out, the injections being repeated as long as there is any indication of decomposed matter.

FACIAL FISTULA.

Dominion Dental Journal.

When a fistula has opened on the outside of the face, on account of poulticing or from any other cause, do not extract the offending tooth until you make an artificial fistula inside the mouth. The outside fistula will heal by granulation. If you extract the tooth before doing so, the tissue certainly will be greatly depressed, and an uglier scar result.

RUBBER DAM, PUNCHING, APPLYING, RETAINING, STOPPING LEAKS, CLAMPS, LIGATURES, ETC.

DR. R. OTTOLENGUI.

International Dental Journal.

For comfortable work, the rubber, when in position, should embrace at least four teeth; on dark days it is not amiss to take in twice as many. It should lay over the face without a wrinkle, and should not cover the nostrils; it should, however, completely cover a moustache, as the hairs often intervene between our eyes and work. To accomplish this a piece of dam of sufficient size should be stretched over the parts which it is intended to cover, so that the proper position for the holes may be ascertained, allowance being made for the stretching which will be made by the clamp. In this position the cusps of the teeth will show through the rubber, and a mark over each may be best made with an excavator, a pencil not answering as well. If because of the loss of a tooth a space must be spanned, the rubber should not be stretched at that point; if this is not considered, it will be found that when the dam is stretched over the teeth it will not hug the necks of the teeth at this point. In fact, this rule holds for all spaces great or small;

the rubber should be wide enough. In cutting the holes use a device which makes a perfectly round hole, this being the least likely to tear. Make the holes sufficiently large; don't force a molar through a hole which would be just right for a bicuspid. Where the teeth are in close contact, soap a bit of waxed floss silk and pass it between all the teeth first; then soap the edges of the holes in the dam; in this manner there is seldom any difficulty about forcing the rubber between the teeth. Occasionally, even this will not serve. Your predecessor (of course, not yourself) has left a filling with ragged edges, which tear the rubber. In this case the teeth in question should be wedged with soaped wood, as will be described later. The least spreading allows the rubber to pass between, when the wedges may be removed. This is better than trying to force the dam between the teeth with silk; that method not unfrequently tears the rubber, and accounts for the mysterious oozing which occurs whilst the filling is in progress, and is largely responsible for the failure so often reported at the cervical border. If the dam has been properly adjusted, it can be removed in perfect condition. How often have you noticed, after removal, that in addition to the holes made by your punch, there are several others, satellites, as it were, about the greater orbs.

CLAMPS.

Next comes the clamp. In the first place select the one to be used before applying the dam. Choose one which will grip the tooth tightly. Throw away all clamps which would not hurt you if put on your finger. A clamp without a spring is no better than a clock in the same condition. In applying the clamp to a molar in the upper jaw a little trick is found to be most valuable. We begin by slipping the rubber over a central incisor, then over the lateral cuspid and bicuspid, and finally over the first molar, let us say. We endeavor to apply the clamp and find little room, and the patient flinches. The cause is this: The middle finger is the one we use to adjust the dam; it protrudes into the mouth, and as we work towards the molar region we gradually fold the angle of the mouth inward so that at last it is held back by the tip of the finger, and it is difficult to find room for the clamp. Just at this point, take the handle of a burnisher or other instrument and free the check so that the finger passes into the mouth, the check slip-

ping forward; then it will be found that, not being crowded back, its elasticity gives us sufficient room to apply the clamp without pain. This one point has been of inestimable value to me, and to my patients in saving pain.

LIGATURES.

Before passing to ligatures there is a special case to be alluded to. Where the gum has receded and a large festooned cavity is present, the space on either side of the hole which is to embrace the tooth to be filled should be wider than ordinarily made; otherwise, when stretched so far up on the gum, there will be leaking about the edges. Ligatures should be dispensed with as much as possible; they are frequently the cause of more pain than any other part of an operation. It is rarely necessary to ligate more than two teeth, and frequently no ligature at all is needed. The trick is done by inverting the edge of the rubber so that it slips under the margin of the gum; if the root is at all conical, the elasticity will cause the rubber to crawl up and tuck itself under nicely. If a ligature must be used, a little cocaine is useful. There will come to us cases where the ligature is absolutely necessary, and where it seems almost impossible to place it so that it will not ride up around the crown rather than remain at the gum margin. Let us suppose such a case in connection with an upper lateral incisor. The cavity is in the palatal sulcus, therefore the ligature must be forced up. The trick is to tie a good knot in your silk first; placed about the tooth, this knot must come at the centre on the palatal side; it makes a good point of resistance for the instrument, and is pressed up under the margin of the gum, carrying the rubber with it; the gum contracting holds it, and when tightly tied on the labial side holds securely. This is the first point I ever picked up at a clinic, and, as I have never seen it at one since, I would have lost a great deal of satisfaction which it has brought me had I been absent from that clinic.

LEAKS.

I alluded to leaking. In a very wet mouth, after the best precautions, ligatures well placed, it will sometimes happen that moisture will creep in around the neck of the tooth. Take a piece of spunk, dip it in gum sandarach, being careful not to get an excess, and pack it in a rope around the neck of the offender. Then apply a second ligature which shall tie the spunk in place.

The leak will be stopped. If an instrument has slipped and torn a small hole, it may be stopped with a bit of sponge dipped in sandarach. Where the leak is about a clamp, the clamp should be taken off carefully, a fairly large piece of spunk, treated as described, placed along the edge of the rubber, and the clamp reapplied so that it bites the middle of the spunk holding it in place. As to the slipping of a clamp, it sometimes occurs because the dam is held too tight by the rubber strap which passes around the head, or there is a strain from the dam weights.

In some cases it will be found impossible to apply the dam at all. There is a way of using the napkin which may not have occurred to all. A small mouth napkin is rolled into a narrow fold, and placed about the tooth in the shape of the letter "U," the ends forward. It is so arranged that the folds extend slightly upon the sides of the tooth where it is firmly held in place with a clamp. There is a special clamp made for this purpose by Dr. Ivory, but any clamp of suitable form will answer.

CEDAR WOOD CANAL POINTS.

DR. JAMES BUBEC.

Dental Register.

Split red cedar into small pieces, place them in paraffine heated to a boiling point, allow them to fry until all the moisture is expelled and the wax permeates the wood. The reason for preferring this wood is, that cedar is almost indestructible, and although dense is also soft and when driven into a canal will adapt itself. The paraffine renders it impervious to moisture.

OPERATING FOR CHILDREN.

DR. G. B. DILLON.

Dental Review.

Cut away gently, but quickly, so much of the dentine as is necessary to retain a filling. Dry the cavity with cotton and warm air, cover with a light coat of carbonized resin, then over this place a small disk of gutta-percha. If the pulp is nearly, or quite

exposed, cut out the center of disk, put in a drop of chlora-percha and place a second disk over all.

The cavity may now be filled, or remain weeks on trial, and in the meantime the smaller cavities should be filled.

There is no use, when a child comes to us with one or two aching teeth, to fill or treat them and let the others go. In that way we are almost sure to lose the patient and he lose the teeth.

RETAINING DRESSINGS IN TEETH.

DR. W. MITCHELL.

Dental Review.

The following is a method I have found very useful in retaining dressings in teeth that have been fractured by an accident; or where the walls of the cavity are so broken down as to prevent the possibility of retention by any other method. Take a piece of rubber tubing, such as is used for regulating, and of requisite calibre to pass readily over the tooth, cut to length required to envelope crown of tooth. To facilitate application where the teeth are close together, soap the tubing slightly, then with the aid of a pair of right and left burnishers, or other suitable instruments, it can readily be carried to place. When in situ the band covering point of application can be distended, application made, and band allowed to assume its original position.

CEMENT FILLING.

DR. R. OTTOLENGUI.

International Dental Journal.

There are a few points about oxyphosphate fillings worthy of note. We have all noticed that what is left on the mixing dish is usually more adherent and harder than what we put into a cavity. Both these facts depend on circumstances which are usually absent in the mouth. To make a dense filling it should be allowed to set thoroughly before the dam is removed, and moisture should be excluded for at least twenty-four hours. This may be accomplished

by using a coating of chlora-percha over the finished surface of the filling. If the dam is left on until this varnish has hardened by the evaporation of the chloroform; it will not wear off for a week, and I have known it to last two months. Such fillings are comparatively permanent. Where we wish to utilize the sticking or cement quality of this material, the best result is obtained by first lightly coating the surfaces with the liquid. This is why the material is so adherent to the slab. I have thus cemented regulating fixtures to teeth, and at the completion of the work found it troublesome to detach the cement from the enamel after the fixture had been forced off.

RUBBER DAM HOLDER.

DR. L. O. TAYLOR.

International Dental Journal.

This holder is made of piano wire, bent in the shape of a bow. On the ends are fastened large beads. A weight is fastened to the bow. The dam is stretched over the ends of the bow, and the spring of the bow keeps the dam stretched out of the way. If small balls are not used on the ends, they will punch a hole through the dam.

SEPARATING TEETH WITH RUBBER AND WOOD.

DR. R. OTTOLENGUI.

International Dental Journal.

When using rubber allow a bit of it to protrude below the cutting ends of the teeth. This part, by contraction as the teeth move, will swell, and the rubber is prevented from pressing up against the gum. To apply the wooden wedge, proceed thus: The wedge is trimmed to the proper width and should approach a taper very gradually. If it is then made smooth with a bit of sandpaper, it will be less likely to split. Lastly, it should be soaped. A second wedge should be made quite thin, and have a shoulder,

which will prevent it from passing between the teeth beyond that point. This, also soaped, is placed between the teeth next to the gum, temporarily. Now, when the permanent wedge is forced into position, this one first placed prevents it from hurting the gum, and offers a slippery surface for it to slide against. The wedge in place and trimmed to suit, the temporary slip is removed, and this relief of pressure against the gum is gratefully acknowledged by the patient. At the next sitting, supposing the teeth separated but quite sore, gutta-percha should be placed between them and worn for several days. There is a neat trick about this. If the material is softened it is frequently difficult to fix it tightly in place. Cut a piece from a sheet and press it into place cold, then smooth and trim into shape with warm burnishers.

CORK POLISHING POINTS.

DR. B. H. CATCHING.

Ohio Journal Dental Science.

Put a piece of cork on the screw mandrel, fasten in hand-piece, run the engine; with a sharp knife you turn in a few seconds one of the best devices for polishing teeth or fillings.

ANNEALING GOLD.

DR. W. C. BARRETT.

Dental Review.

My apparatus for annealing consists of a tray of the finest thin sheet steel, with symmetrical indentations for holding the pellets, so that they may not come in contact with each other. Probably mica would be better for the tray, and, indeed, I have used it, but it burns out after awhile, and, besides, it cannot be indented like the steel or iron sheet, and the pellets get in contact and cohere, thus causing trouble; I have, therefore, for a long time, used only the iron tray. Beneath this tray is a small Bunsen burner, to which it is attached, the tube not quite as large as that of a common gas burner. The relative supply of gas and air to

this is so arranged that the flame can be turned down to the smallest point. The flame which I ordinarily employ is not more than an inch high, and proportionately small, while the combustion is so nearly perfect that it is difficult to tell by sight whether or not it is lighted. It gives me an average temperature for annealing of about 700° F. Some foils will anneal sufficiently at 600° while others require 800°. Gold at a cherry-red heat is about 2000° F.

ROOT FILLING, HILL'S STOPPING AND EUCALYPTUS.

DR. E. NOYES.

Dental Review.

I use the Hill's stopping, which is better than base-plate, gutta-percha, or any of the forms in which gutta-percha stoppings are made. The Hill's stopping with the pure volatile extract of eucalyptus is sufficient, and you may carry it to the extreme limit desired. Eucalyptus is a trustworthy antiseptic in this connection, and a permanent one when used in that way. It is my belief that the combination of materials is such that the shrinkage is less likely to be the case. Now, if a root-canal is thoroughly dry and wiped out with the slightest trace of eucalyptus, and the Hill's stopping is dipped in the eucalyptol bottle it may be carried immediately into the canal and churned in as far as it is necessary to go. If you can once get within the canal and the canal is dry, it is only a question of the proportion of eucalyptus; you may save enough to carry it to the end.

PULPLESS TEETH, TREATMENT.

DR. GEO. CUNNINGHAM.

British Journal Dental Science.

In the treatment of dead teeth with alveola fistulæ, the tooth and root are well cleansed; the cavity is filled with gutta-percha, a small opening being left in the center to permit the canula of the syringe to approach the pulp-canals, and a tepid solution of per-

manganate of potassium is forcibly thrown through the root and fistulous opening. The canal is then thoroughly filled with shreds of cotton dipped in the following preparation: Iodoform, Peruvian balsam, equal quantities; glycerine, q. s. Soft wax is then placed in the cavity over this impregnated cotton, and thoroughly compressed, so that the preparation may be forced to pass out by the apex into the fistulous tract. The wax is then replaced by cement, and the gums are painted with concentrated tincture of iodine.

JAW SUPPORTER AND STATIONARY MIRROR.

Dental Office and Laboratory.

Take a mouth mirror that has been broken from the handle, fasten to it a piece of wire, sharpen end of wire and pierce into a cork, letting the patient bite the cork. This forms a desirable supporter for the jaws and the mirror can be turned to any desired angle to assist the operator.

UNITING NEW GOLD TO OLD GOLD FILLINGS.

DR. I. WILSON MOORE.

Dental Cosmos.

Dress off the surface to be united, dry with absolute alcohol or chloroform, make a ball of cotton about the size of a small shot on the end of a small instrument, dip into alcohol and ignite, with which anneal the surface of the old gold filling.

PROTECTION FOR THE UPPER TEETH WHILE EXTRACTING LOWER TEETH.

DR. W. G. FOSTER.

Dental Cosmos.

To overcome the difficulty, take an impression of a medium-sized natural upper denture; take a cast of it; wax the cast over the teeth to about the thickness of an eighth of an inch on the cutting edges, and running back as far as the second bicuspids,

allowing the wax to reach only to the margins of the gums, and made much thinner than on the cutting edges. Then invest as in any case to be vulcanized, and pack with soft or velum rubber, preferably the black. After vulcanization trim with sharp scissors, boil and wash, and allow to remain in the air for two or three days. I suggest the making of three sizes. Being made of soft rubber insures a fit, as the elasticity of the rubber allows it to be adapted to any mouth, and holds it there securely. Vulcanized soft rubber after a time becomes hardened and brittle to a certain extent, as is seen in artificial palates. When in this condition place it in boiling water, adding a little borax, and allowing it to boil from five to ten minutes. This will restore the elasticity to the rubber, and it will then be in as good condition as when first vulcanized.

ROOT-FILLING IN ITS RELATION TO DISEASE.

DR. R. OTTOLENGUI.

Dental Mirror.

It seems to me unfortunate that many men are filling all roots in one way—that they adopt a pet system and use it in all cases. The more observant dentist differentiates between differing conditions, and has chosen a method which seems best adapted to each.

The first condition, and the simplest, is where a patient presents with an aching pulp. There are three subdivisions of this class, each of which must receive notice if we are to be thorough in this discussion.

The tooth has ached slightly, and it is decided that the pulp must be destroyed. Let us suppose that arsenic is applied, and that on the following day the pulp is removed entire, with slight pain. The procedure is simple. With the pulp before us we determine exactly the size of the canal. If it is sufficiently large to insure thorough filling, it need not be touched with a reamer, but should better be filled as it is. Immediate root-filling is indicated; delay is dangerous—the inviting home for bacteria should be filled at once. Shall a medicament be used? I think that a coagulant is here indicated, and that the one better than all others is chloride of

zinc. The pulp being removed, and the medicament applied, what results? The escharotic property is exerted at the point immediately in contact, and the animal matter is destroyed. But this action is circumscribed. Somewhat deeper, a coagulum is formed. But there is another property which this agent posseses, and that is the mumification of animal tissues. This, I conceive, is what occurs in the minutest portions of the tubuli. Experience has shown me that teeth thus treated do not discolor to an objectionable extent.

Condition similar to the last, but, upon endeavoring to remove the pulp, excessive hemorrhage is produced. It becomes impossible to remove the pulp except in shreds, because of the tenacious attachment of the odontoblastic layer to the canal walls. In the first condition I said that, if the size of the pulp as seen indicated that the canal was large, a reamer is not to be used. This implied that if the canal were small, it should be enlarged. But it is different in this second condition. Not only are we in doubt as to whether we have removed all of the pulp tissue, but we are reasonably sure that odontoblasts are still clinging to the canal walls. A reamer is the only sure way to become satisfied that the canal is thoroughly cleansed. If used, it will be found that at first the debris is stained with blood; but later it is found to be pure white—a satisfactory evidence that all is thoroughly accomplished. At this point, of course, we are to consider the use of a medicament. If the hemorrhage ceases, the procedure is the same as in the last instance—a dressing of dilute chloride of zinc for a few moments, followed by immediate root-filling. If the hemorrhage is uncontrollable, a dressing of equal parts of oil of cloves and creosote may be used, and the tooth temporarily filled. If the patient can return in two or three hours, it would be well to fill the root at such a time. It should be done as soon as possible.

I come now to a condition which I have never seen explained, though one which I have met frequently. Patient presents with aching tooth. Diagnosis pulpitis, although no actual exposure is to be found. Arsenic is applied. Patient returns in a few hours in increased agony. Dressing is removed, and in succession all the drugs in the office are used to relieve the pain, but are ineffectual, till finally the pain becomes more bearable, lessened by the time which has elapsed since the removal of the arsenic. Patient is dis-

missed with some soothing agent in the cavity. Reports next day that a most uncomfortable night has been passed. Tooth found to be less sensitive to the touch, and decay is thoroughly removed. Approaching the pulp, however, evidence of vitality is found, and arsenic is cautiously applied in small portion. The experience of the day previous is repeated, and recurs for several days. In a case of this character the patient suffers greatly from pain and exhaustion from loss of sleep, and the operator is amazed to find arsenic so inefficient. Perhaps he buys a new supply. The diagnosis is simple if the symptoms are exactly as described, and the method of procedure the only one which will save the patient several days of torture. In these cases the pulp has begun to calcify. Frequently the entrance to the chamber is filled with pulp stones. These form an effectual barrier to the full activity of the arsenic, but sufficient enters between the globular masses to produce the great disturbance which results. As soon as the patient returns the first time complaining that the pain is unendurable, and it is found that soothing agents do not give relief, an anæsthetic should be administered and the pulp stones and the pulp itself removed while the patient is unconscious. The canal should be reamed out as thoroughly as possible, and the root filled at once. The coagulant is contra-indicated here, because nature has already cared for the contents of the tubli.

We may now discuss filling materials and the method of filling. It has been charged against a reamer in a root canal, that it is manifestly impossible to ream around a curve. This is not entirely true. Where the canal is tortuous, there being a curve along its main length, the flexible reamer, which has a safe end, in the hands of the expert converts the passage into a straight canal by removing the curve walls. When there is a sharp angle at the extremity, the safe end of the reamer bars farther progress and guards against drilling through the tooth at that point, which not only would frequently result in disastrous consequences, but deceives the operator into believing that he has merely passed through the foramen, whereas in fact he has not reached the foramen at all, but leaves uncleansed that curved portion. Having reamed a root which has a sharp angle at its extremity as far as the safe point will permit, an exploration is made with a flexible unbarbed broach, and on removal the presence of this curve is indicated by the bend

in the broach. This being known, the canal is reamed even larger if possible, to allow free approach to this danger point. Then Dr. Evans's silver-pointed root-dryer is heated and used, the hot fine point being readily forced into this curvature. In these cases I use a thin oxy-phosphate pumped in with a fine instrument till I am satisfied that the walls are smeared thoroughly. I then complete the filling by sliding into the mass a cone of gutta-percha. My object in this: The cone serves a double purpose; it forces the soft oxy-phosphates ahead of it, and it renders the root filling more easy of removal should future exigencies make this necessary.

The second condition to be considered is where the patient has allowed the pulp to die, and shortly after presents in great pain, suffering with pericementitis. This is familiar to all of us. The tooth is sore to the touch, the patient wants relief, and yet does not wish to submit to an operation of any kind. I sometimes give an anæsthetic and thoroughly open the entrance to the canal. Occasionally it will be sufficient to tie a silk ligature around the neck of the tooth and allow the patient or assistant to pull on the tooth while the engine work is being accomplished. Access being obtained to the chamber, it remains to remove the dead and putrescent pulp. Nothing which comes to us is more difficult to accomplish without pain to the patient or, by pushing a portion of this dead material beyond the apex, causing an infection which will result in abscess. Peroxide of hydrogen is useful in this place, but must be handled with extreme caution. In the first place, be sure that the agent is neutral. It may be used with a syringe, a few drops being forced into the canal, the needle not being pressed in to any depth. Allow a few moments to elapse, that the whole mass may become saturated by capillary attraction. Then remove the dead pulp as may be most readily done, the circumstances indicating the method. At this initial sitting—the tooth being quite sore—a reamer should not be used, but a paliative dressing of one of the essential oils should be gently placed in the root and covered with a temporary stopping. These dressings must be renewed daily until all soreness has subsided. They are to be preferably of the essential oils, no coagulant of any kind being under any consideration placed in the canal. It may be as well to mention here some of those agents which may and which may not be used. I copy from the list published by Dr. Harlan: The oils of cloves, cinna-

mon, cassia, turpentine, sassafras, camphor, cajeput, sanitas, boracic acid, chloroform, eugenol, eucalyptol, myrtol, benzol, and several others may also be used. Liquid vaseline is a non-coagulant. It is usually prepared with a trace of benzoic acid. As vaseline by permeating the dentine makes it thereafter less permeable to water, an excellent dressing is found if you mix liquid vaseline with any of the oils named, or, better, with eugenol.

The coagulants which are frequently used in teeth, and yet should not be used, are alcohol—how frequently men use this to dry a canal!—carbolic acid, campho-phenique, aromatic sulp. acid, tinct. iodine, tinct. myrrh, tinct. opium, creosote, tannic acid, spirits camphor, hydro-napthol, listerine, wine of opium, salicylic acid, and others. None of these should be used in a tooth root except as already advised. I have not mentioned iodoform. If it is an aqueous solution it is slightly a coagulant; but if it is a saturated solution in ether, it may be used, and I have used it in many cases with excellent results.

It is plain from what I have said, that I consider immediate root-filling contra-indicated in these cases. When the soreness has passed away the canal is to be cleansed thoroughly, dried, and filled. The method which I use is as follows: Red gutta-percha is dissolved in chloroform, and in it is placed a piece of waxed floss silk, which is then removed and allowed to harden somewhat by the evaporation of the chloroform. This gives you what is practically a cone of gutta-percha which has silk in it. The solution is pumped into the canal, and the gutta-percha and silk packed in till the cavity is filled. The object is that, despite the utmost care, pericementitis may recur in such a tooth, and renewed treatment becomes necessary. After a tooth of this kind has been brought to a comfortable stage, it should be filled with gutta-percha or oxy-phosphate for several months, rather than risk renewed disturbance by malleting gold.

In cases where what is known as "blind abscess" occurs, the treatment is similar, especially where there is a pus discharge through the root. That is to say, coagulants must not be used, and immediate root-filling must not be resorted to, nor a permanent filling inserted, till after several weeks or months. If, however, the operator should decide from the exigences of the case to drill through the gum and process, thus producing artificially a fistula,

the procedure thereafter would be the same as in ordinary abscess which present with fistula.

The third condition, is that of alveolar abscess proper, and is to be divided into two classes, acute and chronic, each with a special treatment.

The acute abscess presents with a puff of the gum tissue, and we open it with a bistoury, releasing the pus and relieving the pain. A tampon dipped in oil of cloves should be left in the opening, and the patient dismissed till the following day, nothing being done to the tooth. On the second day the tampon must be removed, the sac thoroughly cleansed of pus, and if possible the diseased tissue burred from the end of the root with an engine burr. The canal may be attended to at this sitting if the soreness has subsided. All remains of the pulp and septic matter should be removed from the tooth, as well as all decay. The canal should be freely opened and reamed out. In cases of abscess, whether acute or chronic, the reamer is specially indicated, because the walls of the canal are saturated with septic matter and frequently softened to a cheesy consistency. All of this softened dentine must be removed, even though the canal be enlarged beyond the necessity for filling. The root being thoroughly cleansed, the procedure is different from that in either of the cases already described. In the first instance it was shown that the contents of the tubuli demanded our attention. They do also after abscess, though in a different way. Of course in all these operations it is understood that the rubber dam is in position, if at all practicable. The Evans root-dryer is to be used till there is a distinct feeling of heat on the part of the patient, and the hissing sound emitted from the contact of the heated point with the moisture present ceases entirely. As much moisture as possible being thus abstracted, one of the essential oils, let us say oil of cloves, is to be pumped in. The tooth thus dried out will absorb a great deal of the agent. This may be left for a minute or two, when the root is to be again dried out as before, and a second application of the oil made. This may be repeated three or four times, or until the operator feels assured that the agents has entered the tubuli thoroughly.

In these cases immediate root-filling is the only treatment which promises no return of the abscess. My practice is to pack at the extremity a small quantity of the canal paste recommended by

Dr. Van Woert (oxide of zinc, iodol, and carbolized vaseline). Right here it must be observed that, though this contains ingredients which are coagulants, they are not used in the tooth till the contents of the tubuli have been rendered aseptic. The canal is then sealed, as already described, with thin oxy-phosphate and a cone of gutta-percha.

In chronic abscess the procedure just described may be essayed first and the root and tooth filled. Should the fistula reappear, thus proving that the abscess persists, it becomes necessary to either operate or abandon the case as incurable. If an operation is decided on, as it probably would be with any of the anterior teeth, the patient should be anæsthetized. In some cases gas will serve your purpose. But in a cuspid, or a two rooted bicuspid, ether is the only satisfactory anæsthetic, because of the time involved in the operation. The patient under its influence, a quarter or even a third of the root or roots are to be amputated and removed. This is done as follows: with a spear-shaped drill, drill through the centre of the root from the labial toward the palatal side. Follow with a new sharp fissure burr operating laterally both ways, thus severing the end of the root. This may be done with little injury to the gum, and is not at all difficult. To remove the root after it has been amputated is the part requiring the anæsthetic, for even a skilled operator may take an hour to accomplish it. Sometimes it may be pried out at the first attempt, but in extreme cases the alveolar plate must be removed before the root can be extracted. This may involve a large opening in the gum, but with proper care it will result in a perfect cure. The filling of the root where amputation has been decided on at the outset, occurs after amputation, and may best be done on the day after. The wound should be packed in the interim with cotton. When the patient presents, the end of the root will be in view. I ream through the canal till I see the reamer emerge at this point; I smear the canal with solution of gutta-percha, and fill with a cone, forcing it through the end. Then with a burnisher make this smooth by removing the excess.

As a dressing for these cases and any similar wounds where a loss of tissue is to be restored by granulation, I have had the utmost satisfaction from liquid vaseline, which I have said contains benzoic acid, mixed with menthol, five per cent.

The fourth class of cases are those where crowns are to be used. Unfortunately these too seldom receive the treatment which would be accorded were the natural crowns in place. They are to be treated exactly as they would be if they were simply decayed teeth; and the crowning operation is to be decided on exactly as has been indicated for immediate root-filling. Wherever immediate root-filling is indicated, the immediate setting of a crown after the other treatment has been attended to is permissible. Where immediate root-filling is contra-indicated, as in pericementitis and blind abscess, the crown should not be set until the tooth has been treated thoroughly, and then should be fastened with gutta-percha rather than with cement, just as a temporary filling was advised instead of a permanent one. To remove a crown set with gutta-percha, it is only necessary to heat the beaks of a pair of forceps, and hold the tooth till the heat has been transmitted, when the gutta-percha will become softened and the crown slip off easily.

In conclusion, I have to say that these directions, of course, do not apply to all cases; we can make no binding rules. In the matter of root-filling, a dentist must be a physician; he must recognize the pathological condition with which he is dealing, and be governed accordingly. His mechanical skill will be needed to perfectly carry out his method; but the most skillful mechanical dentist will not produce good results unaided by a knowledge of the symptoms of health and disease.

UNITING PORCELAIN TO AMALGAM.

DR. C. H. LAND.

Items of Interest.

I have discovered and perfected a method of causing amalgam to adhere to porcelain, or any other vitrified substance, demonstrating a wonderful degree of tenacity; and, most important, provides a means of establishing both fillings, inlays, and porcelain crowns with a cement that is absolutely impervious to the action of the fluids of the mouth. By actual tests, the adhesion will sustain a weight of over two hundred pounds to the square inch of surface covered in practice. I have molar crowns composing simply the

cusps, the proximal side has a biscuited or porous surface fused thereto. This service is then saturated with a solution of gold, and, when completed, forms a tooth section provided with a coating of pure gold, adhering firmly to the porcelain. To this gold coating, amalgam will become thoroughly and firmly attached. In many instances, the roots of molar teeth may first be built up with amalgam and allowed to harden; it is then trimmed to a convenient shape, a suitable gold lined crown selected, and amalgam burnished to the gold surface; also, amalgam is burnished over the prepared root, and the two carefully malleted together; a quick setting cement is then placed between the crown and the adjacent teeth. This holds the cap in place, until the amalgam becomes hardened, when it can be removed, and all rough surfaces polished. By the aid of this new discovery, a great variety of new and useful operations are made possible.

Large cavities in molar teeth may have porcelain stoppers amalgamated in place. Eighth, quarter, half, three-quarters, and entire crowns may be cemented to defective teeth with a substance, that years of experience have shown is absolutely free from being destroyed by the secretions of the mouth.

CAPPING PULPS, FLAGG'S FORMULA.

DR. L. F. KELLOGG.

Dental Review.

The material I use most in capping exposed pulps is made according to Flagg's formula for zinc sulphate. The powder consists of calcined sulphate of zinc, pulverized to an impalpable powder, one part, and calcined oxide of zinc two or three parts, and these thoroughly triturated.

The fluid consists of gum arabic 15 gr., water ½ ounce; after it is thoroughly dissolved add one gr. sulphite of lime and filter.

The parts should be kept dry and a thin mix made of the cement, and a portion placed accurately over the point of exposure and the frail dentine surrounding it.

A short time should be allowed for the capping to harden, when it may be covered with oxyphosphate or any suitable non-conductor,

to give sufficient depth of non-conducting filling to break off thermal changes. The balance of the cavity may be filled as indicated.

I think when due care and skill have been used in the successive steps it is unnecessary to insert temporary fillings.

TO SEPARATE TEETH.

Dental Record.

Take a tuft of cotton and pull it into pieces so that the fibres are parallel to one another. Next reduce one end to a thread by twisting it between the fingers and thumb, pass this between the teeth to be separated, and draw it forward with a pair of tweezers. This gradually separates the teeth with a power which has scarcely any limit, and must be exercised with discretion. The point at which to stop being when there is just a feeling of discomfort.

The ends of the cotton tuft are then cut off pretty close to the enamel, and the saliva moistening the cotton causes it to separate the teeth beyond one's expectation.

Another extremely useful way of separating teeth, especially back ones, is at the first sitting to prepare the cavity roughly and fill the space with gutta-percha, bringing it against the side of the adjacent tooth. The saliva causes the gutta-percha to swell, and so separates the teeth. The cheaper forms are the best, since there is a greater tendency for them to swell.

A CONVENIENT HELPER.

DR. L. P. BETHELL.

Ohio Journal Dental Science.

When inserting a gold filling in the anterior teeth it happens that the under wall has not been built out enough and gold must be added from the under side, by slipping a matrix of thin steel, such as ribbon saw material, between the proximate surfaces, the gold can be welded much easier, with less liability of chipping the tooth enamel.

COMBINATION OF GOLD AND TIN AS A FILLING MATERIAL.

DR. W. D. MILLER.

Southern Dental Journal.

I will confine myself to a brief statement of the qualities of this material, the manner of preparing and inserting it, and of the cases in which it may be used to particular advantage.

The material is prepared by laying a sheet of No. 4, 5, or 6 non-cohesive gold foil upon a sheet of No. 4 extra tough tin foil,

Rope of tin-gold prepared for filling.

cutting them into 2x4 strips, and rolling each strip together to a soft rope.

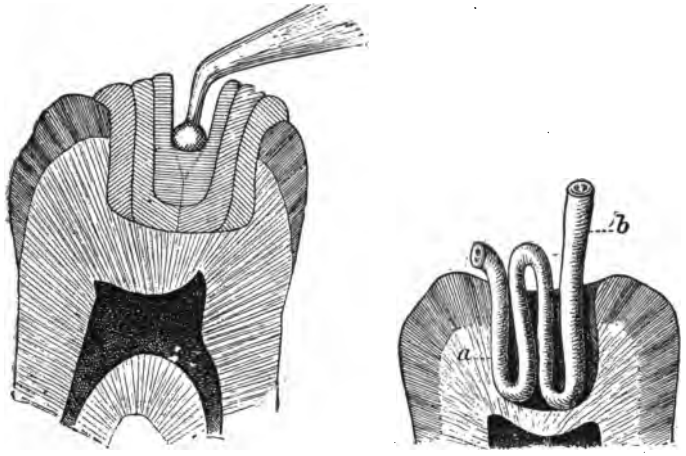
Rope of tin-gold cut into pieces.

These ropes may be cut into short pieces, or they may be used whole in a manner similar to soft gold ribands. The material is inserted on exactly the same principle as fillings of non-cohesive gold, and anyone who has learned to fill with the latter will have no difficulty whatever in filling with tin and gold combined. I shall not, however, take up your time with a long description of the manner of inserting the material. The illustrations will give a better idea than I could convey by words. The instruments are few and simple. A set which I recommended a few years ago is to be had, I believe, at White's. Of this set, I use chiefly Nos. 1, 2, 5, 6, and 7. However, almost any plugger may be used, the chief requisite being that it have a square, and not a round, point, as a large part of the packing is done with the side of the instrument.

PROPERTIES OF TIN AND GOLD.

The qualities of the combination of tin and gold, which have seldom failed to gain the approbation of all who have given the material a fair trial, are: (1.) Its exceeding softness and adaptability. (2.) The ease and rapidity with which it may be inserted.

Moderate-sized cavities on the grinding surface may often be filled more quickly with tin and gold than with amalgam or cement, when we calculate the time required to mix the latter materials and, eventually, the time we must wait for the cement to partially harden. (3.) Its indifference to moisture. A slight amount of moisture, during the filling, does not interfere with the progress or success of the operation. (4.) The consolidation of the material subsequent to its insertion. Without entering into a prolonged discussion of the causes of this consolidation, I will say that it is owing to an electro-chemical process through which the tin is dissolved and redeposited upon the surface of the gold. By this means the material becomes rigid and all parts of the filling thoroughly bound together; at the same time a slight expansion of the



a—manner of folding rope into cavity; b—rope of tin-gold.

material takes place, leading to a more complete closure of the cavity. (5.) The combination of tin and gold is a poor conductor of heat.

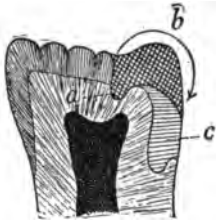
The combined material has the disadvantage of discoloring more or less, assuming various shades from gray to nearly black; it, however, never discolors the tissue of the tooth. It has neither therapeutic nor antiseptic action.

IN WHAT CASES IT MAY BE USED TO ADVANTAGE.

(1). Cavities on the grinding surface of the upper, and in some cases of the lower third molars, may be filled in one-third of the time, with one-third of the labor and inconvenience to the patient,

and at the same time be much better filled with this combination than with gold alone.

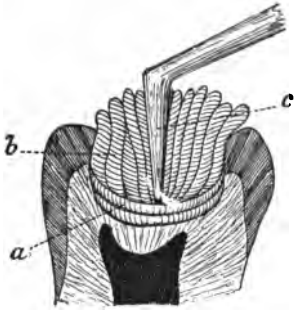
(2). In cavities on the grinding surface of molars only partly erupted, tin and gold is vastly preferable to gold; it adapts itself better to the soft structure, preserves the tooth better and renders the very painful operation of adjusting the coffer-dam in this case unnecessary.



a—anchorage for gold; b—arrow which shows extent of gold contour; c—cervical margin filled with gold.

(3.) Cavities in poorly developed 6-year molars of children at the age of 6–10 years are much more easily filled and better preserved with tin and gold than with gold alone.

(4.) Cavities on the buccal surface of the molars, particularly those lying near to or under the margin of the gums, where the insertion of gold is very difficult and painful and the success very doubtful, and where cement is worthless, may be filled with tin



a—shows layer of tin-gold to protect the pulp; b—vertical folds of rope of tin-gold; c—wedge-shaped instrument for forcing the material against the walls of the cavity.

and gold with comparative ease and with a greater chance of success than is furnished by any other material. In many such places its only rivals are copper amalgam and gutta-percha.

(5.) For small cavities on the grinding surface of the temporary teeth tin and gold is admirably adapted.

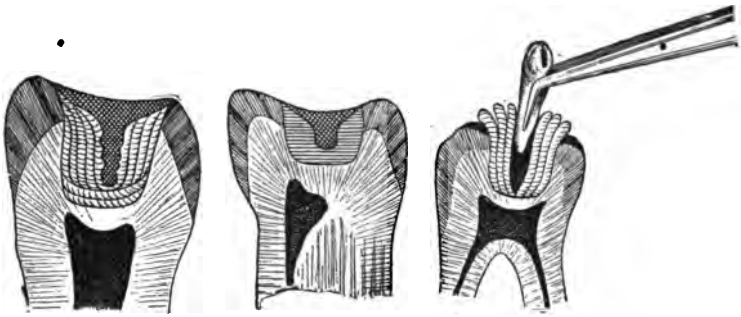
(6). In all cases where, for any reason or other, the cavity is not perfectly freed of decaying dentine before filling, tin and gold serves an excellent purpose. By dipping the first piece in concentrated carbolic acid and placing it on the floor of the cavity, it preserves a permanent antiseptic condition and excludes to a certain extent, if not entirely, the possibility of decay going on under the filling.

COMBINATION OF TIN AND GOLD WITH GOLD CAPPING.

In the majority of all gold fillings tin and gold may be used in the beginning to great advantage, shortening the operation by one to two-thirds, rendering it much easier to both patient and operator and securing equally good, often better, results than an equally skillful operator would secure with gold alone.

Following are some of the cases in which the tin-gold may be used in conjunction with pure gold:

(1). Small, deep, narrow cavities on the grinding surface it is



simply waste of time and labor, as well as an absolutely unnecessary infliction upon the patient to fill up the cavity with solid gold. Fill two-thirds with tin-gold, then cover with gold and you have an operation done in half the time, which in most cases is better for the tooth.

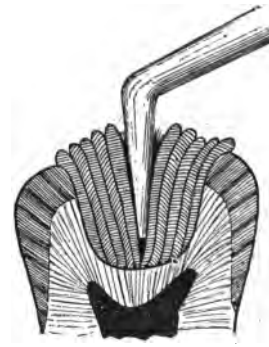
(2). Cavities with strong, overhanging walls of enamel, which it may not always be convenient or desirable to remove, i. e., bottle-shaped cavities should never be filled with gold alone. They may be filled to the neck with cement or with tin-gold. In the latter case, a wedge-shaped instrument is forced into the center of the filling, driving the material against the walls of the cavity and the opening thus made filled with gold.

(3). In crown cavities of the molars with numerous fissures, the outer half of each fissure may be filled with tin-gold, closing the center with gold. It lightens the operation by half for both parties.

(4). All very large and deep-crown cavities approaching near to the pulp should be begun with tin-gold, first, because of its poor conductivity for heat; second, because of the ease of insertion; third, because of its great adaptability.

The cavity is first filled almost full with tin-gold, packing against the walls; the center is then driven in with wedge-shaped or square instruments and then filled up with gold which forms a key. The central gold plug may be very small, or it may be extended quite to the margin of the cavity, so that when the operation is finished only gold will be seen.

There is no occasion whatever to fear that a gold key in the center of a tin-gold filling may fall out. I have never yet observed



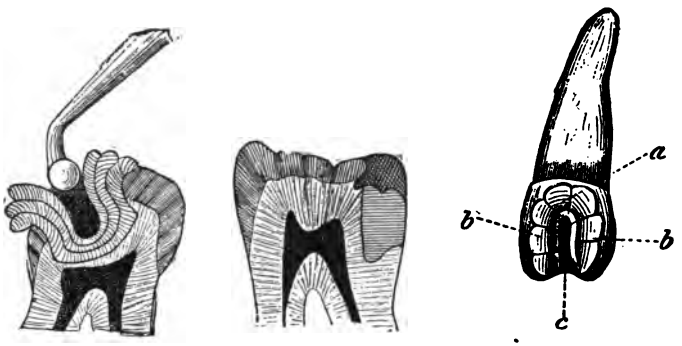
such a case, even where the depression made in the tin-gold was very shallow. In a short time the gold combines so firmly with the tin-gold that it cannot be separated.

(5). Inestimable service is performed by tin-gold in filling compound cavities on the approximal, or approximal and grinding surfaces of bicuspids and molars. We all agree that these operations are difficult, painful, expensive, of long duration and doubtful success.

In filling compound approximal cavities with tin-gold and gold, the matrix can be employed to advantage. A pellet of the material is pressed against the buccal wall, a second against the

lingual, a third as a wedge between the two, and the whole then driven against the cervical wall with the hammer.

This operation is repeated until one-third to three-fourths of the approximal part of the cavity is filled with tin-gold. This is accomplished in five minutes. We then begin the gold on the grinding surface and build it over the tin-gold.



Where the grinding surface is not implicated, we obtain anchorage for the gold cap in short grooves or pits in the lingual and buccal wall. It is surprising, however, how kindly the gold "takes to" the tin-gold, and how little anchorage is necessary to retain the gold cap. As already stated, the gold firmly unites with the tin-gold in the course of time.

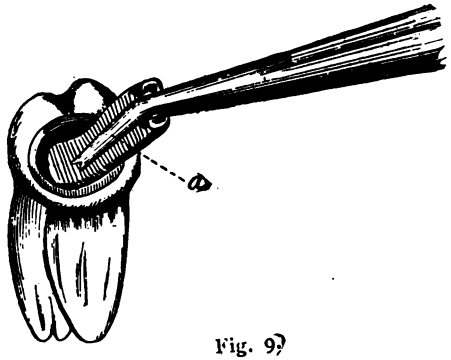


Fig. 9.

(6). Cavities in the upper incisors, with frail labial walls and broken-down palatine walls, are best served by combined fillings. Cover the labial wall with a few pellets of non-cohesive gold and complete the operation with tin-gold. Any one who has been in the habit of filling such cavities with cohesive gold, and learns to fill them as described, will experience a delightful sense of relief.

(7). For repairing defective gold fillings, no material serves the purpose, in many cases, so well as tin-gold. In conclusion, gentlemen, let me beg of you not to condemn the material before you have made its acquaintance. Rest assured there are many good qualities in tin and gold, and there are very many places where it is better adapted than any other material we possess.

RUBBER DAM—HINTS ON USING.

DR. WARWICK.

Archives of Dentistry.

The first point to be observed in applying the dam, is the position of the teeth and their relation to each other; this is essential from the fact that the points for punching, and the nice adjustment of the dam depend upon these conditions. The necessity for observing this rule is obvious, as misplaced holes will almost invariably set the dam askew and create many folds, which exclude the light and greatly impede deft manipulation, and which are difficult to control, even with the aid of an assistant. The dam being properly punched, the spaces between the teeth should be examined; if they will permit the passage of a ligature, little trouble need be had; if not, space should be gained, for the dam will not pass where a ligature has failed. It is not infrequent that some difficulty is experienced in retaining the dam until a clamp or ligature may be applied, and especially is this the case with molars and ill-shaped teeth; those who have assistants always at hand can readily overcome this vexatious problem, yet it often becomes necessary to accomplish this operation without such aid. If the tooth, or teeth, to be exposed be too far back to allow retention of the dam with the thumb and fore-finger until a clamp is placed, the rubber may be slipped over the clamp and both adjusted at once, or a pin may be used, after the method suggested by Dr. Herbst, as follows: Take an ordinary pin and cut it off, leaving sufficient length to pass the inter-space at the gum margin, with a slight projection on each side; this is inserted first, when the dam is hooked over it, thus a retention is gained until a clamp or ligature can be adjusted. In case the space is too great to retain the pin, a ligature and bead may be resorted to: pass the ligature through the bead and tie it about the

tooth, leaving the bead on the lingual or palatal surface, the knot serving the same purpose on the labial side, pass the dam over, and with the aid of a thin, curved burnisher, press it under the ligature; this, in many cases, is a happy recourse. In those cases of marginal decay, so often met with, the difficulty may be overcome by using a ligature of fine binding wire; the wire must be annealed and twisted snugly about the tooth with a pair of small, flat-nosed pliers, leaving the extension on the labial surface; with a gentle pressure the dam is carried above the cavity; if the ligature is inclined to slip, a gentle pressure with the finger will retain it.

In regard to preparing the dam, six by eight inches is a convenient size; this measurement being sufficient to meet most requirements. When the dam has been applied, a napkin should be placed under it and retained, either by pins or by the clamps attached to the holder. The napkin should be removed as often as it becomes moist, as this relieves the patient of much discomfort and avoids an overflow of saliva, which is objectionable indeed. Aside from the holder, weights are of great assistance in controlling the free ends of the rubber.

DRY COPPER AMALGAM.

DR. HENRY BARNES.

Ohio Journal Dental Science.

To mix for filling, heat a quantity in an iron spoon until the globules of mercury appear all over the surface and crush to powder while yet in the spoon; again heating until the mass presents a dark appearance, when it is placed in the mortar and triturated for a few moments; now add a little water, which will facilitate amalgamation; again place in the spoon and heat until the water is entirely evaporated, when it is transferred to the chamois skin and twisted into a ball; now place in the vise, and while tightening, twist the chamois at the same time, which will express the mercury and leave an amalgam rather hard and not easy to manipulate. Now, if broken up into small pieces and placed in the cavity piece by piece, it can be worked with a burnisher of proper size and shape for the cavity, either by hand or, better with the engine, when a

hard polished surface having a copper color will be the result. This will become very black, but will not cup nor discolor the tooth. Any of the copper amalgams now sold will produce the same results if only the mercury with which they are all overloaded is thoroughly expressed. Don't be afraid of burning the amalgam, as overheating seems to be good for it. The object of this paper is not to make the filling of teeth with amalgam easy, but to overcome some of it defects and thus get the best results.

CONSERVATIVE TREATMENT OF THE DENTAL PULP.

DR. ARTHUR C. HUGENSCHMIDT.

Southern Dental Journal.

My practice has been—when a pulp has been exposed in the operative chair, the dental tissue around the exposure being in a healthy condition—to wash out the cavity as thoroughly as possible with sterilized water. If, however, I fear that the cavity has been in the slightest degree contaminated, pieces of cotton dipped in an acidulated solution of bichloride of mercury 1-2000 and passed in it several times. The capping is next applied, which consists in a mixture of a very small quantity of finely-powdered iodoform or salol with lanoline, these two bodies being among the least irritating substances I know of. Over this a small plate of mica is placed, which is an excellent non-conductor, and the cavity is then filled with oxychloride or oxyphosphate of zinc. I have never had trouble with any case treated in the above manner.

Never ought a pulp that has been exposed for some time be capped at the first or even second sitting. It ought to be treated as inflamed or infected wounds in general surgery by antiseptic dressings, until the pulp has resumed its natural color and ceases to present the least trace of suppuration.

The mode of procedure that I have adopted has been to remove as much of the decayed dentine as possible, not hesitating to render a small exposure of the pulp larger by resecting away the diseased tissue, if I think that part to be too much infected to be thoroughly neutralized by any medicinal agent. If the pulp is very sensitive, a

saturated solution of muriate of cocaine is applied for a few minutes on the pulp, or even crystals themselves are used. This enables one to remove much more of the decayed dentine than one would probably otherwise do; and I think that the distant results of the capping do not depend so much on the small or large exposure, but more on the quantity of decayed dentine left in the cavity, or again on the state of the pulp when the permanent capping is applied.

The remedy I mostly use is iodoform, very finely powdered. I do not always use it, on account of its disagreeable odor, when I substitute salol. When the cavity has been thoroughly cleansed and the pulp is well exposed to view, we apply our dressing, which consists, for the lower teeth, of iodoform powder or salol powder, placed over the pulp and bottom of the cavity. For the teeth of the upper jaw, to enable their easy introduction, these powders, either the one or the other, is mixed with lanoline. When this remedy is in position, a pellet, of absorbent cotton, is placed over it, and then a piece of some resisting material, such as mica, a small piece of sheet lead or gold. The cavity is then closed with the temporary obturating material, either paraffine, soft gutta-percha or even oxychloride of zinc. If the tooth gives no trouble, the dressing is allowed to remain in for a week; at that time everything is removed from the cavity. One is almost sure to find a trace of pus on the cotton; while the pulp has a much more normal appearance, the red cherry color will have disappeared. Another dressing is now applied in exactly the same manner, not forgetting the absorbent cotton, which is placed to collect any inflammatory products. The tooth is then again allowed to remain quiet for another week. Two to four dressings are usually sufficient, when the permanent capping can be introduced and no further trouble need be expected. At the time of capping, the pulp must have resumed its natural rosy color, and no trace of pus—not the least—must be found on the piece of absorbent cotton of the last dressing.

If, as a temporary filling, one uses during this treatment pieces of cotton saturated with a varnish instead of paraffine or gutta-percha, one has to be very careful that the absorbent cotton be well separated from the other by an impermeable material—mica or a metal foil of some kind—to prevent the varnish from being soaked up by this absorbent cotton, which would no more perform the duty which is expected from it.

As regards the permanent capping, I use the same material as above, a mixture of either iodoform and lanoline or salol and lanoline; over this a small plate of mica, acting as a non-conductor as well as a protective against the pressure of the permanent filling; next comes the oxychloride or oxyphosphate of zinc.

COLORING ARSENICAL PASTE.

Southern Dental Journal.

Dr. Jas. B. Hodgkin colors the paste with carmine, thus enabling him to more readily handle and detect it.

GLASS FILLING, HERBST METHOD.

DR. JAMES A. BRUCE.

International Dental Journal.

There must be three or four kinds, or rather colors, of glass,—viz: white, brown, and yellow, with occasionally a little blue,—so as to adapt the filling to the color of the tooth. The best results obtained by Dr. Herbst are produced by using beads, careful to obtain those having very little or no transparency, such as milk-glass. These are ground very fine and mixed according to the color of the tooth. I find the best way is to have a good average color, and for any alteration necessary a small quantity of white, yellow, or brown, as the case may need.

Prepare the cavity in the mouth without any undercuts; but leaving it with nice, sharp edges, the latter being an important part in the success of the filling.

Next, line the cavity with one layer of No. 60 gold foil, pressing it to place with india-rubber or some such material, and finally taking a wax impression (the wax being used hard), the gold being withdrawn in the wax. The result is a sharp impression of the cavity into which plaster and pumice, in proportion of two to one, respectively, is run. After this is thoroughly set, boil out the wax, leaving the model with the gold coating.

Proceed with the glass filling by placing a few grains of sand in the bottom of the cavity (to make the cement adhere firmly) and

a little glass mixture, moistened on the top, very little more than enough to hold the sand together. Dry thoroughly, and then make use of a Bunsen burner and mouth blow-pipe, the former being necessary to get rid of the smoke. Heat until a blaze is formed, then allow it to cool off, and then add your second coating, which very nearly fills the cavity, and proceed as before. The third coating is to bring up the glass exactly to the edge of the cavity. It is done in the same way as the others and forms the last layer. This process very much resembles continuous-gum work; but the excessive heat is not needed. When cool, remove the filling from the plaster and gold and it is ready for insertion in the mouth. Before inserting, however, make slight undercuts in the cavity without altering the outer edge. The gold used gives a very much sharper edge to the glass filling, and altogether seems to fit the cavity better than when doing without it.

The filling is made in a very few moments and can be prepared by an assistant, and in places, such as the labial surfaces, can, with practice, be made a very good match to the color of the natural tooth and a perfect fit. Perhaps I might add that it is always well to have the filling slightly darker than lighter than the tooth. These fillings when once inserted into cavities with cement are so firm that it is almost impossible to remove them.

Dr. Herbst adds to the above the following suggestions:

"It is somewhat difficult to procure the right kind of beads. They are such as are used for needle-work. There should be one color mixed with three parts of the white and one part of the brown glass, ground previously in an agate motar as fine as possible. First try the color by burning one layer and add a little of the white or brown glass as the filling may require."

BLEACHING TEETH.

DR. K. M. FULLERTON.

Archives of Dentistry.

Materials recommended: Best chlorinated lime, 50 per cent. acetic acid. Oxalic acid, if more rapid results are desired.

Good chlorinated lime is in the form of a dry powder; when moist, it is worthless. It should have a strong odor of chlorine.

A rough test can be made by adding to a solution of indigo, in a test tube, a small quantity of chlorinated lime; to this add strong acid, and note the rapidity of change in color. If this is very slow, or not accomplished at all, the chlorinated lime is unfit for use.

INSTRUMENTS.

These, though very simple, require special notice, for neglect in this particular will involve total failure. No iron or steel instruments should be used in any connection with the agent employed in bleaching. This must be impressed on the mind of every operator. The reason for this is, that the salts of iron formed discolor the teeth very rapidly. It would be preferable not to use any steel instruments at any stage of the operation, but this is difficult to avoid in the excavation of the cavity. Instruments can be made of hard wood that will serve the purpose, but ivory, platinum, or gold can be used in place of this—either of the latter materials making efficient instruments.

Extreme care must be used not to produce any unnecessary irritation. The removal of all remains of decomposed pulp from the canal is of vital importance, but this must not be done in a rough, rapid, careless manner. It is of great importance that no imflammation of the periosteum should supervene, as that not only complicates the operation, but renders it more doubtful of success. The removal of the pulp should be followed by the usual treatment given to a tooth, and no attempt should be made to change the color of the tooth until all evidences of putrefaction have been removed, which will be manifested in the absence of the odor of decomposition.

If this preliminary process has been satisfactorily conducted, the next step will be that of filling the canal at its upper third. Gold is claimed to be the best material for this. The question may be asked, Why fill the upper third? Because it is absolutely necessary for success that the root should be bleached, as well as the crown. It must be remembered that the pulp chamber requires the same careful treatment as that given to the canal. It must be thoroughly cleansed of all debris to its fullest extent, and that, in the incisors and cuspid teeth, is almost to the enamel line of the cutting edge. Having proceeded thus far, the case is now prepared for the further process of bleaching.

The next point to be considered is the insertion of the material. Before this is attempted the canals and crown should be well washed with a solution of either borax, sodium bicarbonate, or ammonia, to remove fatty matter. It should then be well washed with distilled water. The tooth is then dried, the rubber dam having been applied at the beginning of the operation. There are several methods of bringing the acid used in connection with the lime. This apparently simple matter is really quite difficult. One process is, to saturate the entire canal and pulp chamber with the acid before inserting the chlorinated lime. Another is, to dip the instrument into the weak acid solution and then into the lime, and pack rapidly into the cavity; and still another is, to make a paste by the use of distilled water, and pack this in the tooth, and then apply a stronger acid by means of cotton wrapped around the point used. There are difficulties attending all these modes. The point desired must be kept constantly in view—that of having acid sufficient and of proper strength to break up the compound and set free the chlorine used, and to preserve as much as possible of the latter for bleaching. Before commencing the packing everything should be ready, so the cavity can be sealed at once.

Convenience of adaptation must govern the choice of the material used for closing the cavity. Gutta-percha may be used with good results. After sealing the cavity, the tooth must be left for a day or two. On the return of the patient, remove all of the application, avoiding the use of steel instruments. Syringe out the canal with distilled water. If the bleaching has not gone far enough, a second application must be made, and this be repeated until a satisfactory result is obtained. The importance of using distilled water must be insisted upon.

The immediate bleaching effect will be observed on the lower third of the tooth where the dentine is the thinnest. In the majority of cases this will be effected by one application. The greatest trouble will be found at the gingival border. Here the dentine is very thick, and it will be slow work, and in some cases end in failure, to restore normal color. The operation, simple as it is, requires close attention to details and a clear comprehension of possible results.

The tooth having been restored to a good color, the next consideration is the proper filling to place in it. In this connection

the before-mentioned fact still remains an important factor, that the tubuli are still filled with decomposable matter. To allow this to remain without attention to future contingencies, must result in eventual failure. To effect any good results, the antiseptic must not only operate in the main canal, but penetrate deeply into the minuter conduits. This quality is possessed in a remarkable degree by chloride of zinc, and maintains the same effect when combined with the oxide of zinc, forming the oxychloride of zinc. The canal and pulp chamber should be thoroughly filled with this paste, or it is better to line the whole cavity with it, and then finish with the oxyphosphate, using gutta-percha at the cervical margin.

MAR 20 1900

PULP CAPPING.

DR. J. TAFT.

Archives of Dentistry.

I do not believe in flowing oxyphosphate directly over the pulp; neither do I believe it a good plan to put carbolic acid over it. My method is either to mix oxide of zinc with oil of cloves and apply it carefully, or to apply the oil of cloves directly to the exposed portion, then dust the oxide of zinc on that; afterwards flowing oxyphosphate in a creamy condition, and waiting until it hardened, then fill the rest of the cavity.

ANCHORAGE FOR GOLD FILLINGS, ZINC PHOSPHATE.

DR C. J. PETERS.

Archives of Dentistry.

The cavity being ready a small amount of cement is mixed and placed in it. On this is put a cylinder of gold large enough to cover the floor of the cavity. Work the gold into the cement, at the same time working the latter all over the cavity. Trim cement from the edges and proceed with the filling, making a mechanical anchorage of the gold with that anchored by the cement. The best results are obtained by using soft cylinders over the cement, con-

tinuing with the same and finishing with strips of annealed foil. Another good way is to proceed to fill with gold the same as if you were not intending to use cement, holding the pellets in place with another instrument until enough has been introduced to take the form of the cavity, then remove and place a little cement in the cavity and force the gold back, wait until the cement sets and proceed with the filling.

BLEACHING TEETH.

DR. A. W. HARLAN.

Dental Review.

It matters not what the original cause may have been, there are teeth to be whitened and made less hideous to the beholder.

One method of bleaching teeth which has not received the attention it deserves is the following: Method No. 1. The root having previously been filled, all decay is removed from the cavity, and it is thoroughly washed with aqua calcis. A freshly prepared solution of chloride of lime is placed in the tooth and this is in turn gently touched here and there with a dilute solution of sulphuric acid, less than three per cent. of acidum sulphuricum dilutum. This will liberate the chlorine, which will bleach the exposed discolored dentine. Rewash the cavity with lime water and repeat the process as before, when it will generally be found that the tooth is satisfactorily bleached. The theory of this process is that the coloring matter is so altered as to become soluble in the alkaline lime water and the bleaching is complete. Carbonic or tartaric acids may be substituted for sulphuric by this process.

Method No. 2. The cavity in the tooth having been freed of grease, serum and decay, is washed in a dilute solution of soda. Freshly dried aluminum chloride is placed in the cavity and Labarraque's solution of chlorinated soda is introduced on cotton with a pair of platinum, wooden or gold tweezers. The chlorine is liberated and the coloring matters are thereby rendered soluble in a solution of carbonate of soda, which may be used to wash the cavity.

Method No. 3. Wash the cavity with a solution of biborate of soda, introduce dried aluminum chloride and add freshly pre-

pared, or at least a freshly opened quantity of hydrogen peroxide. In a short time, three or four minutes, the bleaching will be effected by the decomposition of the Al_2 Cl_6 in the tooth and the coloring matter having been rendered soluble in solution of carbonate of soda, may be washed out and this process is complete.

Method No. 4. After cleansing the cavity and removing all visible decay, wash it well with a solution of barium hydrate, then place powdered alum in the cavity and add a solution of chlorinated soda, which will completely decompose the alum and, after the bleaching is effected the cavity must be thoroughly washed with a solution of sodium carbonate and dried. 1. The root must be filled before the bleaching process is begun. 2. The rubber dam must be used. 3. Ordinary hydrant water, rain water or even distilled water must be kept out of the tooth. 4. Steel or iron instruments must not be used. 5. After the bleaching is done oxychloride of zinc of the proper color should be introduced at once. 6. When this is well hardened the gold filling must be made immediately. 7. If the labial wall of a tooth has only the enamel remaining, the interior of the cavity must be varnished with copal-ether varnish, with a bleached brush and pure white glazed paper of suitable size is carefully packed against the labial wall. The paper must not be creased or folded. The above and other precautions are to be observed in the bleaching of teeth in order to secure a satisfactory result. I can assure you that it is often a tedious and trying operation when followed with the minutest detail and persevering faithfulness, but success is assured when all details are followed.

ANCHROAGE FOR AMALGAM FILLINGS, ZINC PHOSPHATE.

DR. C. J. PETERS.

Archives of Dentistry.

Mix the amalgam according to your custom; place on a slab for mixing cement a small quantity of the liquid, and powder ready to mix; the cavity being prepared, dry it thoroughly, and keep it so while mixing the cement. This being done, place a small amount in the cavity, and at once upon it place a piece of amalgam, which should be so manipulated with the instrument suited to the

size and shape of cavity as to force the cement under the amalgam all over the floor of the cavity. Care should be taken to not force the cement entirely to the cervical edge in proximal cavities, and any excess of cement used should be worked out at a point easy of access. By this time the cement is hard enough to be easily chipped off whenever it has been forced beyond the inner edge of the enamel. The filling with amalgam is proceeded with and finished in the usual manner. It is essential that the cement should not be smeared over the edges of the cavity, but carefully worked all over the dentine, closing the mouths of the tubuli, allowing the enamel edge free for contact with the amalgam. In very deep cavities it is well to work into the cement a piece of hardened amalgam before inserting the fresh, as it lessens the amount of cement necessary, and also of the amalgam, and again prevents the tendency to spheroid. Proximal cavities in children's teeth are very easily filled with amalgam by this method, and without causing pain in cutting tooth structure.

PORCELAIN FILLINGS.

DR. A. H. STODDARD.

Archives of Dentistry.

Shape the cavity to general form desired, without making any undercuts. Leave the more careful trimming until the time for fitting the filling into place. Take an impression of the cavity with Ash's modelling compound, using it in the form of a pencil. Warm one end over a small flame, and thrust it into the cavity, taking care to get an accurate impression of the tooth immediately surrounding the cavity, as well as the cavity itself.

The color is now selected from the sample colors. Each sample corresponding in number to a body of that number. In this manner there is a certainty that the body, when baked, will be the color desired. Cast the impression without oiling it, and use the plaster very thin. After separating trim the margin of the cavity, in the plaster model, till it is slightly larger than the cavity in the tooth, to allow for shrinkage in baking, and make a slight undercut. Then mix the body of the desired number to the consistency of cream, pack the plaster model full, and cover with a

thin coating of enamel. Place in the gas furnace, bake about two minutes. This biscuits the filling so that it may be removed from the plaster, otherwise the model would melt when subjected to the intense heat in the furnace. Continue the baking about six minutes longer and the filling is fused. When cool, grind to fit set and polish.

RUBBER DAM, STOP LEAKS.

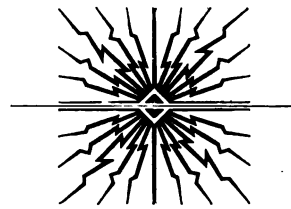
DR. M. H. FLETCHER.

Archives of Dentistry.

Spunk and dry plaster of paris used, takes up moisture and sets, adhering to the teeth and rubber.

DR. CHAS. MILES.

Thrust a heated instrument through the rubber and it will adhere.



PROSTHETIC DENTISTRY.

SOLDERING SMALL GOLD PIECES.

DR. J. B. LITTIG.

International Dental Journal.

If you have a plate with two or three teeth which you wish to attach by means of solder, back the teeth and fasten in position by means of hard wax; then take moulding-sand and wet it thoroughly, until it is of the consistency of soft putty; place this on the soldering block, press the plate into it, and bring the sand well up around the teeth. Now take your blow-pipe and throw a broad, gentle flame around the outer edges of the sand, taking care not to let the flame touch the plate or teeth until the water is driven off and the wax begins to blaze; then direct the flame upon the wax and burn it off. Scrape well the parts upon which you wish the solder to flow; then place on the solder and borax, and proceed as usual. Partly fill a saucepan with water, and place it over a gas or oil-stove, and when it boils hold the case, wrapped (investment and all) in a cloth, over the steam for half a minute close to the water; then drop it in, remove and take out the piece. Clasps and small regulating pieces are held together and soldered by this process very quickly. I have yet to crack my first tooth by soldering in this manner, which, I think, is due to the fact that the expansion by steam heat is more uniform than by dry. Sand which has been used for moulding purposes is dangerous to use, as particles of zinc or lead may be present, and thus become alloyed with the gold.

SECOND SOLDERING.

DR. BARRETT.

Ohio Journal Dental Science.

When it is desired to solder a piece that has been soldered in another place, most gold workers consider it necessary to use a softer solder, which shall flow at a lower temperature than that first

used, that the unsoldering of the previous work may be avoided. This is needless if the solder used in the second case be placed in mercury until the surface is slightly amalgamated. If it be then used it will flow very readily, while the appearance of the finished piece is not injured, as the mercury is sublimated in the heating, leaving the solder as it originally was.

HOW TO TAKE A WAX IMPRESSION.

DR. A. N. COATES.

Ohio Journal Dental Science.

Heat the wax until it has about the consistency of dough, then proceed in the usual way to make the impression, pressing the wax moderately against the ridge. Remove carefully, and with a hot knife cut away the surplus wax, cool slowly, and when quite hard replace in the mouth, holding it solidly to place with the fingers, at the same time pressing hard and thoroughly against the labial and buccal aspects of the ridge with the thumbs until the gurgling of saliva ceases. Now, if the impression feels tight to the patient, it should be carefully removed; but should it fail to adhere tightly it should be pressed more heroically until it will remain in position without ulterior support. A re-insertion of the impression in the manner described after it has cooled, produces an astonishingly successful result. This method applies especially to full cases, 90 per cent. of which can be successfully worked.

TO AVOID AIR-HOLES IN FLASKING.

DR. T. F. CHUPEIN.

Dental Office and Laboratory.

When filling the upper ring of a flask—in repairing vulcanite work, it will generally be found that a large air-hole is frequently formed in the plaster just poured in. This is caused by the plaster in the lower ring being dry, and the air escaping from it forms the air-hole. To avoid this, after the case is invested in the lower part of the flask, trimmed, bevelled and varnished ready for the investment of the upper ring, grease the whole surface and place it in a

bowl of water while you mix the plaster for the upper ring. By this manipulation you will avoid what at times is very tantalizing in repair cases. The same procedure may be observed for new cases as well as repair cases.

TO REPLACE BROKEN TOOTH ON CELLULOID.

DR. F. W. SEABURY.

Western Dental Journal.

Select a tooth, cover the pins with an excess of paraffine, place it (paraffine) up in the lower half of a flask filled with plaster; fill the upper half of the flask with plaster, open the flask and remove the paraffine; heat the investment and mould a piece of celluloid onto the tooth, the same as if you were moulding a whole denture. Enlarge the cavity left by the broken tooth, on the lingual side. After grinding the tooth and shaping the celluloid until it fits perfectly, cement it in place with collodion. The union of the celluloid will be perfect, and the tooth will be held as firmly in place as any tooth on the plate.

ARRANGING TEETH.

DR. L. P. HASKELL.

Items of Interest.

To secure the proper arch to the grinding surface, a simple rule suggested to me by an old practitioner, I have found serviceable, as follows:

Arrange the ten anterior teeth so that they will be on a line when placed on a flat surface, and the molars dipping upward on an inclined plane.

Arrange the lower teeth so that when placed on a flat surface only the incisors and second molars touch.

"Circumstances alter cases," so there can be no inflexible rule for the arrangement of teeth, and the dentist must use his judgment. As for instance, in very pointed jaws, especially where the lower

teeth remain, and form a V-shaped arch, the upper teeth should be so arranged that the centrals are the most prominent, the laterals inside the circle, and cuspids still farther inside. This is a very common form of natural arrangement.

PLATE TEETH FOR RUBBER BASE.

DR. J. G. CHISOLM.

Southern Dental Journal.

If plate teeth are used in partial sets on rubber base, bending the pins so as to form hooks or loops, and allowing the rubber to extend nearly to the cutting or grinding surface of the teeth to form a backing, there will be no complaint of loose teeth. The writer has tried both the rubber and plate teeth in his own mouth, as well as in his practice, and is thoroughly convinced.

FINISHING A PLATE.

DR. D. P. VINCENT.

Items of Interest.

Take an impression, at once immerse it in cold water, and as quickly as possible prepare the plaster for the model, and pour it at once, using no other substance to assist in separating than the cold water, except that I dip into hot water occasionally while I chip away the impression from the model. If care is used in chipping away the impression, you will have a model that will exactly correspond with the mouth and that will be free from all bubbles or granulated spots.

Then immediately before packing, (immediately because any other time will not do), coat this surface with liquid silex, and when opening the flask after vulcanizing, the model will break away from the plate, leaving a surface that cannot be improved. For removing the plaster, never use anything sharper than a wax spatula, as a tool with a keener edge would be apt to scratch and mar the surface. Care must be observed in the use of silex, not to allow it to come in contact with the pins of the teeth, as it will prevent a close union of the rubber.

As for the lingual surface, however carefully you may smooth your wax, you can improve this surface with fine sand-paper. Then just before closing the flask, coat this also with the silex, taking care to avoid all surplus as before.

When you open the case, very little plaster will adhere to the plate, and what little does can readily be washed away.

If the teeth are plain, use file and scraper till getting the desired shape for the rim and plate margin, then proceed to carve the gums; after which the plate is ready for sand-paper. For this I use No. 00—½ and 1 emery paper, as it cuts cleaner and smoother than ordinary sand-paper.

Use first the coarser grade and lastly the finer, when it is ready for the lathe.

Here use felt cones and wheels with moist pumice powder till all traces of the sand-paper are removed. To get between the teeth use with the pumice a stiff brush wheel.

Now wash the plate thoroughly to remove all pumice, and dry. Then oil the plate well, and holding it in your left hand, put about a teaspoonful of fine plaster in it; rub briskly with the thumb of your right hand till the plaster absorbs the oil, taking care to reach all parts of the plate. If you cannot do this with your fingers, use your soft brush wheel.

CLEAN JOINTS.

DR. B. Q. STEVENS.

Archives of Dentistry.

When the case is flasked and ready for packing, first cover each joint with a strip of No. 30 gold foil, one-fourth of an inch in width, burnishing it down evenly, and holding it in position with a small piece of pink rubber. Then pack as usual, and find, after vulcanizing the joints perfectly clean, as no rubber can be forced through the gold strips into them.

To avoid the displacement of small pieces while soldering, Dr. Welch says, first burn the borax.

REMOVING CELLULOID PLATES FROM METAL DIE.

DR. F. W. SEABURY.

International Dental Journal.

You can do it every time by immersing the plate with the tin die in a basin of cold water; then hold the basin over a gas-burner, and the flame striking the bottom of the basin will heat the die; before the water boils the plate can be easily removed.

IMPRESSIONS.

DR. W. H. DORRANCE.

Ohio Journal Dental Science.

The object for which an impression is taken should determine not only the method employed—or rather, more strictly speaking, the manner of its taking, but also the choice of materials, so the manner and the material should receive careful consideration.

The impression materials treated upon in this article are as follows: Plaster of Paris, Modelling Compound, Wax (pure and compounded), Gutta-percha (pure and compounded), Clay.

A brief consideration of impression materials will not be out of place, a more full study occurring as the individual material comes to be treated upon, it being premised that in all cases the material chosen is to be carefully handled with an intelligent appreciation of all its characteristic qualities, whether good or bad *per se*. A general principal essential to success may here be laid down. In all cases only the smallest possible amount of whatever material, should be used.

Plaster of Paris under favorable conditions, is capable of receiving sharp impressions of the most minute markings and of the most severe undercuts, enabling these to be taken where the use of any other material would result in failure; when properly prepared and used it produces no distorting pressure, and in event of its fracture, the lines of fracture are usually so sharp that it is not difficult to assemble the pieces. When in proper condition to introduce into the mouth it obeys the laws of fluids and finds its way without pressure to all parts of the surface involved, unless air is enclosed.

Per contra, in cases where the secretions of mucus or saliva is abundant it will not receive a sharp impression; it is not useful where it is desired to produce distorting pressure; it expands, more or less, in setting according to the manner in which it is prepared and the material used to secure its more rapid setting; the distortion of the piece from this cause is marked where the thickness is not fairly uniform. In event of retching, in its semi-set condition it becomes a source of considerable annoyance to both patient and operator, and in any event its use is inelegant as compared with other materials; its unskillful use has produced a not-easily-effaced prejudice in the minds of intending patients against all impressions.

Modelling compound, of good quality, is easily prepared for use; receives sharply the most minute markings; when in a proper condition for removal, is sufficiently elastic to spring by somewhat bulging or malplaced teeth; by proper handling it can be made to displace the softer parts to some extent; the border can be readily modified while still warm, and when cool the impression can be readily carved; there is no change, by expansion or contraction after cooling to ordinary temperature; it gives the least annoyance to the patient and is the more elegant of all impression materials for common use in all cases that present no unusual difficulty. Per contra, it changes the shape in the mouth unless fully supported by proper means; it must be carried into deep undercuts or about a protruding border by subsequent pressure, and in such a case as that of a lower jaw with the crowns of the molars much inclined inward, is quite liable to distortion in removal.

Pure wax, when properly worked and handled (for there is a difference in the terms as here used which will hereafter appear), is very plastic and takes a beautifully sharp impression, and is very pleasant for the patient; it contracts slightly on cooling to ordinary temperature, a quality which makes it exceedingly valuable in a certain class of edentulous cases, and though quite plastic it requires some pressure to force it in place, making it valuable where it is desirable to displace soft parts to obtain a uniform seating for a denture. However, as it has no elasticity, it drags out of shape in cases where teeth are present in irregular positions, so that its use is limited, other materials being available.

The qualities which make gutta-percha valuable for impressions are the extreme sharpness with which it receives an impres-

sion, its toughness, its elasticity and its contraction on cooling. This last quality, so desirable in some cases, makes the material difficult to handle, and it must be used in small quantity and mechanically held to the tray.

Clay is an exceedingly valuable adjunct, its peculiar feature being that the impression can be cast in metal direct. Its uses will be presented hereafter.

To illustrate a simple method of handling plaster of Paris in cases where all or nearly all the teeth are present, the following typical case is taken: Models are desired for the study of a case of protrusion of the upper teeth, and the impression is to involve as much of the border as the muscles will allow, so that the model may exhibit the direction of the teeth to the end of their roots.

The following items are to be borne in mind: The change which takes place when water is added to plaster (hydrated calcium sulphate), and commonly known as "setting," is a chemical change, two molecules of water being needed to satisfy one molecule of the calcium sulphate (it must not be understood by this that two parts of water to one of plaster by measure are needed), which then crystallizes in a new form. Should there be too little water used the plaster is not "satisfied"—the "setting" is incomplete in whole or in part, and failure is the result; if too much water is used the change indeed takes place, but as only two molecules of water are needed to satisfy each molecule of plaster, that which is in excess is held sponge-like and the resulting crystals are held apart, the plaster is not so strong, and a greater change takes place during the process of setting than would occur with proper proportions. An impression is more likely to retain its integrity of shape, and is more easily handled where it has uniform thickness as is consistent with manipulation. For obvious reasons it is desirable to hasten the setting of plaster used for impressions, and out of the number of materials which may be used to accomplish that result, much experimentation has determined that powdered potassium sulphate is the very best setting agent, as with its use plaster changes the least in setting. Experimentation has also shown that the best results are invariably gained when the following method for mixing plaster is used: Take of tepid soft water (cold water retards setting—hard water retards setting) a sufficient quantity, add and dissolve the potassium sulphate in such quantity as experiment with the particular

lot of plaster has determined—say what would lay piled on a quarter of a dollar—add the plaster by small quantity until it raises in a little mound above the water; as that mound begins to settle pour off the standing water, and in a moment stir only sufficiently to make the mass of uniform consistency, when it is ready for use. Plaster too thinly mixed (the usual formula is "to the consistency of cream") and much beaten so as to bring it to a condition for handling, is not only weak when set, but has measurably expanded. Quick setting plasters are weak and unreliable. (Plaster—once good—that has failed by age and exposure, may be sometimes restored by heating in an oven at ordinary baking heat). Plaster for impressions may be colored, if so desired, by the addition of any earth pigment in small quantities, though such addition weakens the plaster. (Where alcoholic solutions of color are used, the purpose is apt to be partially defeated by the plaster of the model taking up the color.)

The patient being properly seated and prepared, a tray is selected which invests the teeth with a uniform space of about one-eighth of an inch from their buccal and labial surfaces. The tray must be not only clean, but as smooth and polished as when it came from the maker's hands, especial care to keep them so, being effort well expended. The tray selected for the case in hand is Ash's "No. 0, X A" (i. e., it is an extra length of No. 0,) and is of the variety long ago misnamed "wax trays," misnamed as it is suitable for any material, its special use being rather that of taking impressions of cases of full or nearly full natural dentures. This tray is formed from Brittania-metal plate, cut and formed to shape and soldered, and can therefore quite easily be modified in shape, and is the best make of tray of its variety in the market. It has one fault—the raised portion in the centre is too broad in its curve (so that it cannot be easily used for a contracted arch). This tray has been modified in its border by the addition of a strip of pure tin (not "tin plate") rolled to the same thickness as the metal of the tray, cut to the proper curve and soldered with a fusible alloy (a strip of Brittannia metal would be more easily handled.) For modelling compound or wax this additional strip would be in the way. If this tray could not thus have been made easily suitable, a rough impression would have been secured, and with the model for a guide, a tray built especially for the case.

Now it must be borne in mind that the feature of this method of taking such an impression is, that for the easy and safe removal of the impression from the model (and the mouth, should its condition render it necessary), the impression shall have two weak lines and all other portions being of sufficient thickness (say that adopted for the border—about one-eighth of an inch) for strength and for ease of assembly in case of fracture. One of these weak lines is easily obtained by simply carrying the tray up until the major portion of the teeth-cusps touch the bottom of the tray; the other, located along the medium line, is secured as follows: A portion of the beeswax, the size of the first joint of the thumb—more or less as the case requires, is softened and pressed to the central portion of the warmed tray, and an impression of the arch from the inner surface of the anterior teeth to the posterior border of the tray obtained, being careful that the tray is carried up until the teeth strike it; remove the tray from the mouth and trim the impression with a warmed knife down to a thin wedge extending the length of the tray in the centre, as illustrated in Fig. 1.

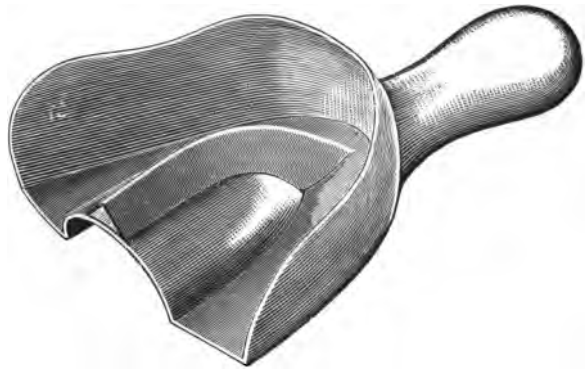


FIG. 1.

This wedge of wax should barely touch the arch when the tray is in position, and leave quite a little space between it and the arch and teeth elsewhere. Now, the plaster being properly prepared, instead of carelessly filling the tray, let the smallest possible amount be spread uniformly over the surface and at the border of the tray, and with the patient's head inclined slightly forward carry it into the mouth and its posterior border first to place, thereby preventing an overflow of the plaster and thus also keeping the impression well under control. When the surplus plaster will break with a

sharp fracture without the least crushing of its edge, it may be removed from the mouth, in not too difficult cases, without fracture. Should it be—by reason of extensive mal-position of the teeth—so securely locked as to render it difficult to remove entire, the tray may be taken away and the border taken out in two pieces by carefully introducing the thumb and pressing upon the border on either side, letting the pressure be downward and outward, after which the central portion may usually be removed entire. It is well at all times to have a pair of foil carriers at hand so that any small fragment it is desirable to save may be easily removed. Now, as the tray is smooth and clean, the cleansed pieces of the impression are easily assembled therein, and the case proceeded with as if the impression had come out entire. In order to obtain the best results, impressions should be filled soon after being taken, and removed from the model as soon as it is well set, say within an hour. Cleanse the impression from mucus and saliva, should there be any adhering thereto, let it be well saturated with cold water while preparing the plaster for the model, and when ready to pour see that all surplus or standing water is removed by blowing sharply into the partially-inverted impression, or better by a large, soft

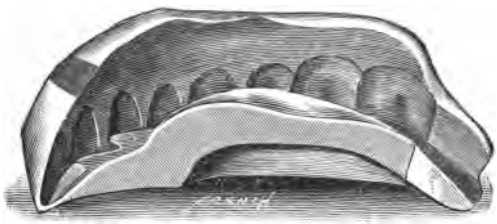


FIG. 2.

camel's hair brush. In filling, flow the plaster carefully from one heel of the impression in such a manner that the slight film of water is carried before the incoming plaster, taking care that none is enclosed, and that the fresh plaster does not cover the border when it is full. Should it be desired to give the model the shape of that illustrated, after having filled the impression, build upon the glass slab a small mound of the now stiffening plaster, carefully press the inverted impression upon its surface, see that it is level, and with the spatula shape the base as desired, taking care not to cover the border of the impression. When the model has well set the tray is easily lifted off after dipping for an instant only into

water, the wax septum is removed, and the impression alone now dipped for a moment into boiling water which expands it so that it readily parts from the model. The border beginning at one heel is now easily pried off with an outward motion, and when off the central portion is removed by pressing inward from either side,

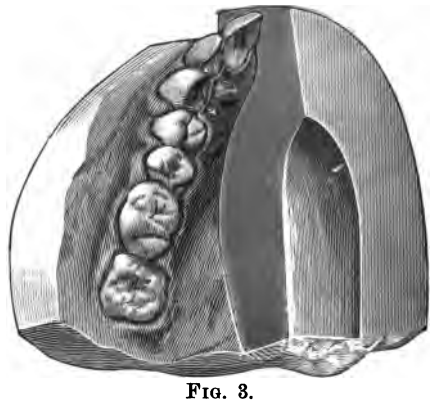


FIG. 3.

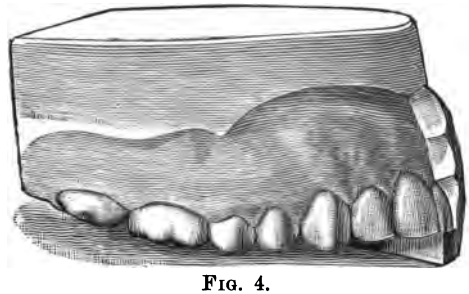


FIG. 4.

when it breaks at the central weak line, Fig. 2, and readily parts from the model in two pieces as shown in Figs. 3 and 4, which are from a model from which one-half of the impression has been removed.

CARE IN MAKING ALUMNIUM PLATES.

DR. J. G. TEMPLETON.

Ohio Journal Dentall Science.

Swaged plates of alumnium are better than cast plates, and it is important to keep lead and zinc away from the material, for if a particle of either of these metals adheres to the alumnium there

will be a perforation of the plate at that point. Swage the plates between sheets of silk tissue paper, putting a sheet of the paper each side of the plate and renewing the paper frequently, so as not to punch holes through it. In vulcanizing, the plaster must not be allowed to come in contact with the alumnium. This can be avoided by coating the plate with sandarac varnish before it is invested, and when it is invested the plaster covers all the surface except that portion covered with wax, so that when separated no portion of the plate shows except that which has been covered with wax.

For retaining the rubber mountings wash the surface clean, first with soap and water and then with alcohol. Afterward scratch it all over with sand-paper, taking care not to touch the surface with the fingers, nor even to permit the breath to touch it. Then with a sharp point score it all over lengthwise and crosswise, and it is ready for the rubber.

DORRANCE'S ALLOY.

Ohio Journal Dental Science.

This alloy is made of silver 1 part, zinc 2 parts, and copper 3 parts (metals must be pure), and is used to alloy gold or silver plate for making solders. It makes a strong, easily flowing, and tough solder that follows the color of the plate from which it is made. It is to be preferred to solders that are bought, and can profitably use plate scraps. If the dental depots would furnish this alloy they would do the profession a service.

REATTACHING PLATE TEETH.

DR. R. OTTOLENGUI.

International Dental Journal.

Occasionally a gold plate is brought to us with a tooth broken off, the pins of course remaining in the backing. It may be that a good match cannot be found, or you may be in a hurry, so that you wish the same tooth could be used. Proceed as follows: Boil the tooth in acid to get the stump of the pins remaining as clean as pos-

sible. Invest it as for a backing. Lay a bit of pure gold over each broken pin and point a fine flame with the blow-pipe till a tiny gold ball is made on each broken pin. These may be filed up and will be sufficiently long to allow backing the teeth, using platinum foil and gold of a lower carat.

MODELLING COMPOSITION—HOW TO USE.

DR. G. S. STAPLES.

Archives of Dentistry.

There are several grades of the compound; keep about two, and by mixing use it just as stiff as can be introduced in the mouth, without burning. Use impression cup larger than for plaster, and a superabundance of the compound; press it up slowly, and keep the lips and soft parts out of the way, until it is thoroughly adjusted all around; previous to inserting, put a Horton's rubber bib on; use ice-water with a syringe until perfectly hard, before removing.

RAPID METHOD OF MAKING A GOLD PLATE.

DR. MICHAELS.

Dental Cosmos.

In half an hour he made a gold plate of four teeth, the time for the setting of the plaster not being counted. The author uses a special gold plate, which is very thin and pliable; it can be worked like sheet-lead. The sheet-gold is smooth on one side and quadrilated or roughened on the other. A good impression must be obtained with gutta-percha. In this impression he runs a mixture of two parts plaster to one of sand, and obtains a model about an inch in height. He then adjusts on this model the teeth as well as the clasps; when a clasp is well adjusted, he tightens it somewhat, and pushes it with force into its proper position, so that it cannot be displaced. When the clasps are in place he takes a piece of sheet-lead and cuts it according to the shape he wants to give to the piece, and having marked the upper surface, he places it on the gold plate described above, and cuts a piece out according to the pattern. He then takes this piece of gold and places it in position,

the smooth side of the plate in contact with the plaster, while the roughened or quadrilated surface looks upward; this is adjusted into position with a good burnisher or other similar instrument. To retain this plate in position he drives little nails about half an inch in length by the side of it into the plaster, and with a pair of pinchers he turns the ends of them so that they press on the plaster surface and render the plate immovable. The teeth are then placed again on the model and plate, and retained in position with hard wax. He then invests the teeth and model in a plaster and sand mixture, while the wax is washed off with boiling water; of course, the whole upper quadrilated or roughened surface must be left exposed, as it is by running solder all over this plate that he obtains the desired thickness. When the plaster is dried, all the spaces that may be left between the plate and backings of teeth or clasps are filled with small scraps of platinum foil made into pellets and pushed into position. After the whole surface and backings have been well covered with borax, the piece is ready for soldering.

TO REMOVE TEETH FROM RUBBER.

DR. D. GENESE.

Items of Interest.

Should it be desired to remove teeth from rubber, either pin or pinless, saw the blocks off close, and put them in pure nitric acid. The rubber will be dissolved, and the teeth look new, and all trace of discoloration disappear from teeth or pins.

MODE OF TAKING AN ARTICULATING IMPRESSION.

DR. SPENCE.

Items of Interest.

In taking articulating impressions, desirable results may be obtained by the use of two sheets of mica ("isinglass") placed together in the lump of warm wax to be used for taking the "bite." Each sheet is laid on a flat surface and warm wax pressed on it, and then brought together, the overlapping edges of wax being pressed

together so as to hold the two pieces as one until the whole is in the mouth. But, first, a slip of wood is pushed into the wax from the front, and just a little aside from the median line, the sheets of mica having had V-shaped spaces cut in them to permit the stick to penetrate the wax sufficiently to act as a handle, and at the same time to prevent the jaws from closing any more than is desirable. In many cases the width of the bite may be determined by the size of this stick, previously whittled to the width desired. The mass is now placed in the mouth, and the first closure made. The operator will then insert his finger, and, in pressing the wax down against the teeth, also sever the slight connection of the edges of the wax, and then the mouth may open and shut freely, indicating by repeated closures what is the correct relative position of the jaws during occlusion. But should the divided halves not separate freely, a thin spatula may be run between them. Before withdrawing the bite from the mouth, the halves may be fastened together by running a hot instrument into the space left in the wax by the stick of wood. If an excess of wax is used, so as to necessitate the cutting away of some of it to allow the lip to fall into its proper position, one or both halves may be easily removed from the mouth and replaced.

ARRANGEMENT OF AIR CHAMBERS.

DR. B. N. BAILEY.

Items of Interest.

When we look for the forces which operate to displace a plate from its place in the oral cavity, we find these forces come to a focus just behind the rugæ, on the median line, and to counteract their effect, and make the plate steady in the mouth, we must apply pressure on this portion, which is from the rugæ to within about one-fourth of an inch from the edge of the plate. Some place the chamber over the rugæ. This is a bad practice, because the irregularity and roughness causes the edges of the air-chamber to fit badly and sink into the flesh. Again, when we bring the chamber too near the point, we find a slight yielding of the gums in using the incisors, and the plate tilts, throwing the posterior edge down. In partial and full sets we leave a margin of one-fourth of an inch

between the chamber and the edge of the plate. If it be the first plate worn, it is best to make the chamber quite small, as each plate that the patient wears must have a large chamber, and the bearing surface of the plate is decreased in proportion to the increased size of the chamber.

TO PREVENT DARK JOINTS.

DR. T. F. CHUPEIN.

Dental Office and Laboratory.

Before flasking, fill with cement over the joints mixed thin, letting it come over the teeth as well, and over this lay a piece of moderately thick tin foil in a strip about a quarter of an inch wide, and when the case is flasked put the cement on the inside, commencing at the joint near the pins and bringing it upward, until it unites with that which was placed on the outside before flasking. This is likewise covered with a strip of tin foil, so as to use every effort to exclude the vulcanite from the joints.

PLASTER MODELS.

DR. W. H. MORGAN.

Dental Headlight.

To make a hard, smooth plaster model: Let impression (I use plaster) dry, give it a thin coat of shellac varnish, or sandarac, colored with dragon's blood; after this is dry, immerse in clear water until it is thoroughly saturated. Mix coarse plaster rather thin, stirring well and jolting to drive out air bubbles and rotten plaster to the top, which latter should be poured off. The impression cup should now be held in the left hand with water filling all depressions, and impressions of teeth if any, and filled by lifting the plaster out on the spatula, being careful to get the plaster from the bottom of the vessel in which it has been mixed. Begin at the heel of the impression on one side, forcing the water out on the other. I sometimes upset the cup and pour all the plaster back into the bowl that will run out and begin again to fill. Having built it up as high as I desire my model, I upset on a piece of broken glass to

save cutting, and secure a smooth, flat surface. Usually an hour and thirty minutes is as long as is necessary for the plaster to harden, after which the impression may be cut away. No model is correct that can be jolted loose from the impression, as the plaster has certainly shrunken away from it.

By following the above directions a model is secured that is not only free from imperfection but actually presents a glazed surface, and if coated with liquid silex diluted with water, (I pour off from the bottle a small quantity into a second and add as much water, and use this instead of that furnished by dealers) and allowed to dry just before packing, the plaster does not adhere to the rubber, and the rubber presents a finished surface that cannot otherwise be obtained unless the surface of the model is covered with tin foil.

In investing, use liquid silex to prevent sticking, treated as before instead of varnish and oil, or soap; it is much cleaner and just as effective.

Models made, as I have described, of coarse plaster, may be used after standing months, but all should be saturated with water before investing, or water that is necessary for hardening the newly mixed plaster will be absorbed.

MAKING OF CLASPS.

DR. J. B. VERNON.

Archives of Dentistry.

Take an impression (in plaster) of the tooth to be clasped; cast into this impression Melotte's fusible alloy. A piece of clasping material, of suitable width, and long enough to encircle the tooth, with ends soldered, is driven and burnished on to the metal die till a perfect adaptation is secured. The clasp can be opened at any point desired.

TO REMOVE PLASTER FROM THE HANDS.

British Journal Dental Science.

A teaspoonful or so of moist brown sugar rubbed well on to the hands while they are wet accomplishes this very quickly.

INVESTMENT—BREAKING, MENDING.

DR. R. OTTOLENGUI.

International Dental Journal.

Occasionally, in soldering, a portion of our investment breaks off, exposing a part of a tooth. We can ill afford the time to patch the break and wait for the plaster to harden again. The exposed portion of the porcelain may be perfectly protected by covering it with a thick paste of chalk and water. This mixture may also be used to fasten small pieces of gold to the solder-block while soldering.

TO PREVENT FRONT BLOCKS SEPARATING.

DR. R. OTTOLENGUI.

International Dental Journal.

You all have seen artificial dentures where, after brief wearing, the front blocks separate, the plate finally breaking in half. To avoid this, permanently unite the blocks by soldering a platinum bar to the pins. To do this, after the teeth are ground to proper position, make a guide with plaster along the outer surfaces and then take off the front blocks. They are set into position in this guide, waxed together and invested, when the soldering may be done, the blocks dropping back into proper place.

SECURING RUBBER ATTACHMENT.

DR. R. OTTOLENGUI.

International Dental Journal.

There is nothing better than the pins from old teeth, soldered to a gold plate, for securing rubber attachments. The graving of a plate or even punching holes is a delusion and a snare. The rubber will separate from the plate some day. The prettiest and strongest plate is made with what we know as "celluloid" teeth, soldered to a gold plate and then rubber vulcanized around them. The plate teeth are not made in as good moulds.

SEPARATING AND COLORING CASTS.

DR. R. OTTOLENGUI.

International Dental Journal.

Don't varnish plaster impressions. Soap the surfaces with a shaving brush. Be careful to wash off the suds, or the mould will be pitted. Put a little red paint in the water when pouring your model, and in separating, the model is easily detected, by its color, from the impression.

VULCANIZING THICK RUBBER.

Archives of Dentistry.

In vulcanizing a plate made to restore the features after the removal of a tumor, a pressure of eighty-five pounds was maintained in a Seabury vulcanizer for two hours, with most satisfactory results. The rubber, which in places was quite half an inch thick, was tough and solid. In drilling into the thick part, to make certain attachments, it was found to be uniformly dense. Ash & Sons' "dark elastic" was the rubber employed.

MAKING SHEET WAX.

Items of Interest.

The best thing for making sheet was is a slab of plaster paris. To make this, take a piece of "dam rubber" and stretch it evenly on a smooth, even board; straining it smooth by tacking with tacks or pins. Then take four pieces of wood, three-eighths of an inch thick, and make a parallelogram about the shape and size it is desired the slab to be, say $3\frac{1}{2}$x6 inches. Make it on the stretched rubber, tacking it through the rubber into the board. Fill this with plaster that has not been stirred, but mixed with water, by sifting the plaster into the water and shaking the mixing bowl. If you stir it, you will get it full of bubbles. When full, place a piece of glass that has been well wetted with soapsuds on the plaster, and press it down evenly all around. Let it set, and on removing the glass and wood, etc., you have a nice, smooth, even plaster

slab, that is to be used wet for dipping the wax. Dip a sufficient number of times to get a required thickness, and scrape one or two edges thus dipped on the rim of the wax dish, and plunge into cold water. The object of scraping the edge is to make a break in the wax, so as to let it loosen from the slab. It requires no soap; nothing but water.

INVESTMENT FOR RUBBER PLATES.

DR. C. T. HOWARD.

Ohio Journal Dental Science.

Make a segment of a circle of pure plaster and vulcanize a piece of rubber in it. When vulcanized, the rubber is not the same shape as the model. Then make a like model of plaster and marble-dust, and the rubber when vulcanized exactly corresponds. Plaster in heating and cooling expands differently from rubber, while plaster and marble-dust expand and contract the same as the rubber does.

DIFFICULT IMPRESSIONS.

DR. E. ANGLE.

Dental Review.

Impressions of the mouth for a full or partial denture should always be taken in plaster. Where difficulties arise, as they often do in partial cases. Oil the impression cup before pouring the plaster, to facilitate the removal of the former from the latter; then divide the outer portion of the impression into three pieces, when the whole can be easily removed and replaced in the cup. After obtaining a good impression of an upper, which must include a part of the soft palate and condyles of the jaw, that portion of the plaster indicating the location of the hard palate—unless of a soft, spongy membrane or tissue over the hard palate—should be trimmed to relieve pressure at that point. Knock the impression out of the cup, trim off all surplus plaster before pouring the plaster for the model.

Incase the plaster impression, after its proper preparation in a

sheet of lead two and one-half inches wide and about 24-gauge, the object of this is obvious. The resulting model should be scraped to the depth of a line on that part representing the soft palate, then with a proper articulation of the teeth, satisfaction for the patient and dentist usually ensues.

MODIFIED McLEAN DISK.

DR. J. F. ADAMS.

International Dental Journal.

It is simply a metal disk soldered to the mandrel instead of fastening it on with a screw. This disk is made of brass, and, after it is shaped to run true, the emery paper is glued on, using a solution of dextrine. When the paper is worn out, it is dipped into a glass of water, when the paper will come off. The advantage of not using a screw is that you can use them for sharpening knives.

CORK BENCH BLOCKS.

DR. E. S. GAYLORD.

Bore a hole in the bench block and glue a cork into it. Valuable for filing small pieces.

SECURING IMMEDIATE SUCTION IN DENTURES.

Dental Cosmos.

The plate is moistened, and then simply sprinkled with fine powder of gum tragacanth. The plate is then pressed in place, and no matter how good or bad a fit, it will hold firmly for a day under almost any use or abuse. The advantage of this will be apparent to any one; for the first half hour or few minutes after a plate is put in for the first time makes or mars the reputation of the dentist, for the time being, in the estimation of the inexperienced patient, whose efforts to "suck up" a plate, if not immediately suc-

cessful, are at once discontinued, the plate is taken out, and the invariable remark is, "It don't fit."

A patient will bring a rickety, ill-fitting plate, and after being without it the few hours necessary to repair it, will insist that the plate fitted perfectly before it was confidingly submitted to our care, but now it feels as though it had been made for another party. A thin coating of tragacanth will even up all irregularities, soothe the wounded sensibilities of the patient, and prevent the plate's wounding the sensitive membrane of the mouth.

SOFT RUBBER-LINED LOWER PLATES.

DR. G. H. FULLER.

Dental Advertiser.

Very satisfactory results are obtained in lower plates for artificial teeth by lining them with soft or palate rubber, and letting it overlap the edges of the plate slightly. Great care must be taken in "waxing up," making the base or model plate exactly as the finished plate should be. The surplus soft rubber can be trimmed off with scissors where necessary. This method makes a lower denture, comparatively free from irritation, and in most cases it will adhere quite as firmly as an upper plate.

SMOOTH PLATES—TO MAKE.

DR. W. H. STEELE.

Items of Interest.

A nice way of preparing plates to come from the flask clean and smooth, and ready for pumice and final polishing, is to be sure and get a perfect, smooth cast. Make your model plate of parafine and wax. After the teeth are mounted correctly, shape the gums and plate just as you would have it for the mouth; then, after trying it in the mouth to make sure it is all right, place it back on the model and flask as usual. When the flask is opened, place both parts in boiling water, and with an atomizer tube go over all the joints and pins, thoroughly washing out all the wax.

Take the flasks out of the boiling water, and immediately coat both the model and the lingunal surface of the plate with a varnish made from pure liquid silex, to which has been added enough fine pure powdered tin, to make it give a good metallic coating. Then set the flasks in the air a few minutes till the varnish is set. Now lightly coat both varnished surfaces with soap to prevent the metal coating from adhering to the vulcanized plate. On opening your flask the plate will come out clean and smooth, requiring but little work to finish.

TO HOLD BROKEN RUBBER PLATES.

DR. F. E. BUCK.

Items of Interest.

A good method for holding a broken rubber plate in position, while it is being waxed up, is to take a round tin box four inches in diameter and two inches deep, with a perforated bottom. Fill this box nearly full of very fine shot. Place the pieces of broken plate in position as they should be; then press down into the shot, drop on the hot wax, and hold box under stream of water to cool. The water will run out through perforations in bottom.

DRY PACKING—STEAM VULCANIZING.

DR. B. H. CATCHING.

Dominion Dental Journal.

Pack with dry heat; set the flask on the oil or gas stove, with flame turned low; turn it over occasionally. When hot enough to begin the evaporation of water from the plaster, lift the flask from the stove and turn the screws; place the reverse side to the heat when returning to the stove. A few minutes and a few turns, it is closed; the rubber is not scorched, and the plaster has been made harder. Dark joints are less liable to occur if, in connection with the dry packing, vulcanizing is done in steam.

Put in the boiler about half an inch of water; place in it a small block of wood, on which set the flask to keep it out of the

water. Raise to the vulcanizing point very slowly, say forty-five minutes, at least, to reach 320°.

Sometimes, in packing this way, a loud exploding report is heard; be not uneasy, it is only the discharge of pent-up steam. Aside from other advantages, this method is cleanly. Keep the vulcanizing boiler scoured clean. A little dilute sulphuric acid will aid this materially.

MODELLING COMPOUND.

Dominion Dental Journal.

French chalk	14 parts.
Gum kowrie	8 "
Stearine	4 "

Melt the latter first; add the second; then the chalk, not too much at a time. Stir it constantly. Color with carmine, and pour it into saucers in thin cakes.

TO MEND CASTS.

Dental Advertiser.

An excellent and quick way to mend broken plaster casts and impressions is to paint the broken surfaces over two or three times with very thick shellac varnish, and at each application to burn out the alcohol over a flame. When the shellac is sufficiently soft, press the parts together, and hold in position while cooling. It will be as strong as it was before broken.

JEWELERS' ENAMEL IN PLATE WORK.

DR. C. S. CASE.

Dental Mirror.

When fused between joints of gum plate teeth, filling the interstices between the plate and tooth, and uniting the whole as in continuous gum dentures, or wherever porcelain has heretofore been held mechanically against metallic surfaces, greater solidity

and perfection in all operations of this class must necessarily result.

The enamel may be obtained for dental purposes from jewelry supply houses under the name of "white-hard enamel," or by breaking it from the face of an old watch dial. In either case it should be ground in a mortar to an impalpable powder, so that when mixed with water to the consistency of cream and laid over a crevice with a camel-hair pencil, it will penetrate into the smallest interstices by lightly tapping the piece. This operation should be continued, occasionally drying the excess of moisture, until the interspaces are entirely filled with the dry condensed powder.

The teeth may now be invested and the piece brought to the required heat for fusing the enamel under the plow-pipe. As the heat requisite for this purpose is far below the fusing point of any of the hard solders there will be no danger of melting the metal. A more satisfactory and uniform result however can be obtained—without investment—in a continuous-gum furnace. For this purpose I can most heartily recommend "The Parker Improved Gas Furnace."

When the enamel is out of sight, a small quantity should be laid upon an extra piece of metal alongside, for a guide as to its fusion; the heat being stopped as soon as the surface of the sample is glassed. Where an unusual quantity has been used to fill wide interspaces, the contraction of the material will often necessitate a second filling and fusing.

TAKING IMPRESSIONS.

DR. L. P. HASKELL.

Items of Interest.

The success of the artificial denture depends on a correct impression as the foundation for the work, therefore care should be taken to insure success. As to materials, I differ with many instructors. Some good impressions can be taken in wax, more in the modeling compound, but most in plaster. It may be accepted as an axiom that the more difficult the case to obtain an impression of, the greater need of plaster.

For a full upper, spread a large napkin over the dress; select a cup as near the size of the jaw as possible; as it is necessary to

obtain a high impression over the cuspids, place a little wax over the outside of the cup at those points, also, over the posterior corners, if the tubersity is deep, and raise the palatal surface at the rear a little if the arch is deep.

Mix the plaster to the consistency of thick cream, and add a pinch of salt, at the last moment, after the plaster is ready, as you do not want to hasten the setting till after placing in the mouth; stand at the right side, and with the left hand distending the lips, press the rear of the cup into place, and so, forcing any excess forward; press the cup into place, at the same time telling the patient to "keep the tongue quiet, and not to be concerned about what runs over at the rear;" then press the lip so as to force the plaster well up under it. If there is nausea, tell the patient to resist the tendency, as it will be over in a few moments. As soon as the plaster has set, which can be ascertained by breaking off a piece of the surplus in front, remove by raising the lip high, and working the impression so as to let in the air.

For a full lower, proceed as above, only standing in front of the patient, and as the cup is passed into place, press the cheeks away from the cup, so there shall not be a fold of membrane underneath.

For a Partial lower, with the anterior teeth remaining, select a cup with an opening for the teeth, and through which they will pass easily. Wet a piece of paper and lay over the opening, and, holding the cup in the palm of the hand, put in the plaster, and place in the mouth, always pressing away the plaster from the front before inserting, so as to have as little outside of the teeth as possible, as it will facilitate its removal. If there are molars remaining, so that the sides of the cup will not go deep enough, place wax on the outer edges. Sometimes the teeth stand in such a position that the plaster must, of necessity, break; this is of little importance, as the pieces will readily go together again.

For a partial upper, proceed as with the full upper, only before inserting, press away the plaster from the sides of the cup where there are teeth, as there will be enough to go outside. Do not let the plaster set as hard as in full cases, or the cup will leave the impression, and the plaster have to be broken away in pieces. This can always be avoided, and should be, as this separation and

after work of removing the plaster in pieces is very unpleasant for the patient.

Never take an impression in wax, and then plaster in it; for while the plaster will break just the same, it will often be difficult to replace or even save in pieces, when they are thin; there is nothing to be gained by it. Be sure your impression is good before dismissing the patient. It is a simple process, only avoid using an excess of plaster, and too large a cup.

SIMPLE METHOD OF TRUING CORUNDUM WHEELS.

DR. L. P. BETHELL.

Ohio Journal Dental Science.

To true up a jointing or other corundum wheel take a straight edged piece of sheet-iron, of about No. 22 gauge, and while the moistened wheel is revolving on the lathe hold the straight edge of the iron against the face to be trued up. A few moments only are required to obtain a surface equal to that of a new wheel.

TAKING IMPRESSIONS.

DR. REESE.

Dental Cosmos.

For a full upper case proceed as follows: After selecting an impression-cup of the right size, take it into the laboratory and drill a hole through the floor of it, and then put a rim of wax all around the cup, making a ridge in the back so that the plaster shall be retained and not forced down into the throat. The rim of wax that is built inside of the impression-cup holds the plaster in contact with the buccal and labial surfaces and prevents it rolling off. On the floor of the impression-cup where the opening has been made put a little sheet wax, and of it build a reservoir, so that in a case where the patient has a small mouth and a very deep arch, after having put the impression-cup in place, manipulate with the fingers underneath that wax reservoir and so force the plaster up, and it gives a very accurate impression. Hold it there about four

minutes. Where otherwise the suction would be very insufficient it has proved by this method very good. In partial sets, where there are overhanging teeth, it is difficult to get a plaster impression. Take an impression-cup, melt a little wax all over the inside of it, upon which place other softened wax, and heat it so it sticks to the impression-cup; then take as accurate an impression as the wax will give. That is cooled in water and the wax removed wherever the plaster is wanted to go through a hole or channel. Then make of soft wax a reservoir; try it in. Then fill in the plaster, having the reservoir full, and having none where the remaining teeth fit in, and take the impression as before described. This method gives a beautiful sharp impression in those difficult cases, almost always perfect, without breaking.

TAKING IMPRESSIONS.

DR. HORACE DEAN.

Dental Cosmos.

In describing my process I will begin with a partial upper case. The first step is to get a wax impression with the teeth as nearly correct as may be. In this cast a plaster model, using salt or potash to hasten the setting, and separating as soon as set, for the heat generated by the quick setting will have so softened the wax as to render the separation easy. On this model place a sheet of wax, and have it cover all portions corresponding with the parts of the mouth of which you wish a copy. Let the wax cover the palatine surfaces of the plaster teeth, but not the grinding-surfaces. In the spaces between the teeth let the wax be quite thick. On this wax plate place a piece of ordinary wire mosquito netting, which carefully adapt so that it covers and touches the wax and the grinding-surfaces of the teeth. Next, in the usual way, coat with separating fluid (I use pure glycerine) the parts of the model not covered with the wax, and place a coat of plaster over the wax and net, being sure that it covers the grinding-surfaces of the teeth and a narrow space at the back of the wax plate. When this has hardened, separate and remove the wax, and you will have a shell of plaster stiffened and held firmly by the wire net. This shell closely approximates the shape of the mouth, and will carry the plaster of your impression

to just the part you wish to copy and nowhere else. When you are ready to take the impression, try the shell in the mouth and trim till it goes easily into place and rests firmly on the ends of the teeth. Then soak it in water to make it more comfortable to the mucous membrane, and also that the impression plaster may stick to it. Next fill the shell with plaster mixed in the usual way, and place in the mouth, pressing up until it rests on the ends of the teeth. You will find that the plaster, while flowing easily and accurately to all parts inside the arch, will not be on the outside of the teeth, and consequently it will be quite easy to remove the impression by pressing down on the two sides of the shell.

For a full upper case you take an impression in wax, being careful to have the wax press as high as possible on the gum. By at once casting a model and hastening its setting, you can retain your patient till the model can be compared with the mouth. Mark on the model the places where the edges of the shell can rest firmly. Then construct the shell in the same way as for partial cases, letting it go as high as possible on the gum. In taking the impression you simply press up till the shell rests firmly on the parts intended, and the plaster flows inside the shell and is not disturbed by any tremor or movement of the hand of the operator. In removing the impression it will be necessary to lift and draw the side of the mouth so as to admit air between the impression and the roof of the mouth, when it will easily drop.

DUPLICATING BROKEN PLATES.

DR. W. H. STEELE.

Items of Interest.

Bring the parts together as for mending, oil the palatine portion of the plate, and pour on plaster. After thoroughly hard, separate the plate from the cast, being careful not to injure the cast while doing so. Now, with file, or lathe bur, remove the rubber rim above and back of the teeth, so that the teeth can be easily drawn from the cast without danger of fracturing, which can be determined by trying. Next, place the parts on the cast in their correct position, wax up as the original plate was, and flask as for a new case. When hard, open up and remove the wax; reclose the

flask again and fasten firmly with bolts or clamps. Heat by dry heat in a cast-iron porringer, or, what is better, a dry air celluloid machine, till the rubber is soft; open up the flask, grasp the old plate by the heel with a pair of pliers, and remove carefully; pack and vulcanize as new work.

SOLDERING BLOCK.

VAN WAERT.

Equal parts of powdered charcoal and pumice, stirred into water till of a muddy consistency, and thickened with plaster of paris, makes a neat soldering block.

A STRONG BASE PLATE MATERIAL.

British Journal Dental Science.

For use in setting up sets to try in, can be made by soaking "paper fibre lint" in stearine just at the melting point. It is important not to have the stearine too hot, as otherwise too much of the fat runs out of the paper when it is taken out to cool. This should be cut to the required size, warmed and pressed on the model, and then the teeth fixed to this by wax.

TAKING IMPRESSIONS.

DR. A. G. BENNETT.

Dental Cosmos.

I had a very bad case, requiring the two laterals and a bicuspid, all the palatal surfaces being very bulging. I tried several of the usual methods, and failed. The question then occurred to me, Why not obliterate these spaces by the teeth required? So I first selected the teeth and ground them up, and after drying the adjoining surfaces, waxed them in place with hard wax. I readily took the impression, afterward removing and placing the teeth in their positions. As you will see, this method requires no articulating out of the mouth, simply putting the wax plate in position and

flasking the case. This way I took an impression of a very difficult case for the two laterals, the other teeth being much denuded at the necks. I ground up the teeth and simply sprung them into place, no wax being needed, and then very easily took a most perfect impression.

PACKING PLAIN TEETH.

Dental Office and Laboratory.

Any case where it is desirable to use pink rubber and have it remain in place. Warm the case with dry heat before packing, and thoroughly paint the parts, where the pink is desired, with pink rubber dissolved in chloroform; keep it warm till the solvent is all evaporated. The pink rubber can then be placed in position and kept there while packing the other rubber. It does not hurt if the pink solution gets into the pins, as it is too thin to form a part of the body of the plate.

AN IMPROVED METHOD OF MAKING FULL LOWER DENTURES UPON CAST-METAL WITH RUBBER ATTACHMENT.

DR. CALVIN S. CASE.

Dental Review.

Cast-metal plates, in combination with rubber, for full lower dentures, have neither received the endorsement nor been used by the dental profession nearly as much as they deserve.

It may not be generally known or fully appreciated that an inexpensive alloy, largely composed of tin, can be easily and accurately cast upon a model of the mouth and can be worn with little oxidation upon its surface with all the beneficial influences to the mucous membrane and contiguous tissues possessed by the royal metals. Such plates for full lower dentures, when properly cast—light or heavy as may seem desirable—with plain teeth properly selected and artistically arranged and attached with pink or granu-

lated rubber, are second only to continuous gum in durability, artistic effect and healthful influences.

A more general adoption of these plates may have been retarded by the difficulties which beginners experience in their attempts to follow the present inexact method described in text-books for their construction. This consists in first casting the base-plate

Fig. 1 shows case ready to be invested in flask. "a. a." indicates the future line of demarkation between metal and rubber.

from a model in wax having a doubled edge or rim, and afterward placing and attaching the teeth with rubber, the same as you would were it a swedged and rimmed gold plate.

Among other difficulties with this method it is not always possible to define the width which may be desirable to give to the rim, or the plane of its outer surface, until the teeth are placed, and the wax gums properly contoured:—a matter of considerable importance, especially with the lingual contour, where it is often desira-

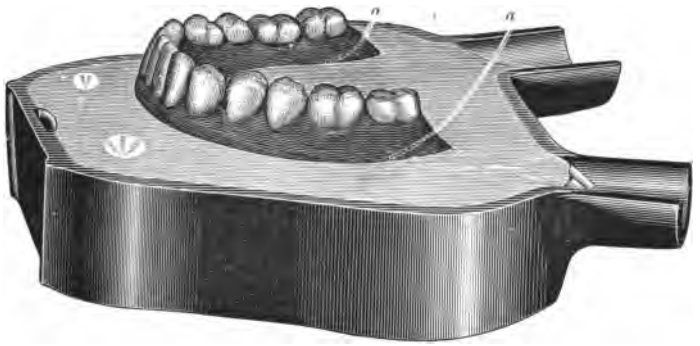


Fig. 2 shows cass partially invested in a Watt flask.

ble to obtain the broadest possible metallic surface with its concomitant advantages.

By the following method the work can be accomplished with mechanical precision, and with little more labor and skill than is required to construct an ordinary rubber denture:

Take two impressions. Fill the better one with plaster and

pumice or marble dust, equal parts; the other with plaster alone. Upon the latter set up the teeth and contour the wax model of the gums the same as you would if about to construct a denture upon rubber alone.

Fig. 3.

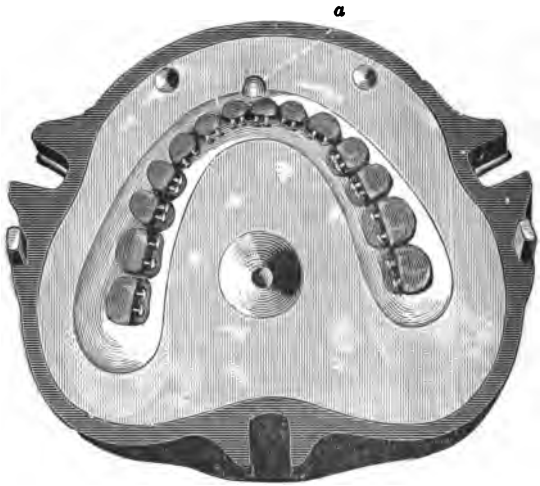


Fig. 4.

Now transfer the case to the other model, which being composed of plaster and pumice may have been broken or injured if subjected to the movements necessary to bring the case to its present stage of development. (See Fig. 1.) Partially invest in the

lower half of a Watt or Weston flask with pumice and plaster; allowing the investment to rise on the sides, to a line which you will have marked on the wax (*a a*, Fig. 1,) where you wish the metal to extend; except at the heels of the plate (*a a*, Fig. 2,) where the wax should be left entirely exposed, to be covered by the upper investment, for reasons which will appear. I usually make the rim on the outside or labio-buccal surface quite narrow in order to avoid exposure of metal, and very wide on the lingual surface, allowing the plaster to rise on the inside nearly to the pins.

Fig. 5.

Make countersunk places in investment for guides, lubricate surface, place over the case the upper half of a rubber flask and fill with plaster. (See Fig. 3. This illustration is wrong where it represents the plaster cut for pour-hole and vent—an act later in the operation.) Warm and open so that only the teeth come away with the upper. (See Fig. 4.) If the wax should be lifted from its position in the lower half of flask it should be pressed back into place, to be subsequently cut and shaped to form a model for the cast-

plate. (See Fig. 5.) This will vary in thickness in proportion as you wish the plate—light or heavy.

The upper surface or plane of the investment, it will be remem-

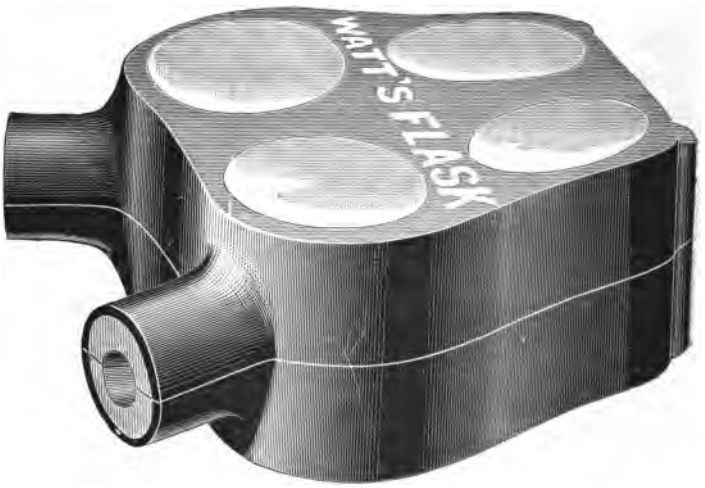


Fig. 6.

Fig. 7.

bered, represents the height or width of the rim, except at the heels, therefore, the wax should be cut down even with this surface, except

at the heels, when you will be guided by the line which has been previously marked on the wax. (*a*, Fig. 2.) That portion of the wax which represents the outer or exposed surface of the metal at the heels may be reproduced at any time by pressing the upper and lower investments together.

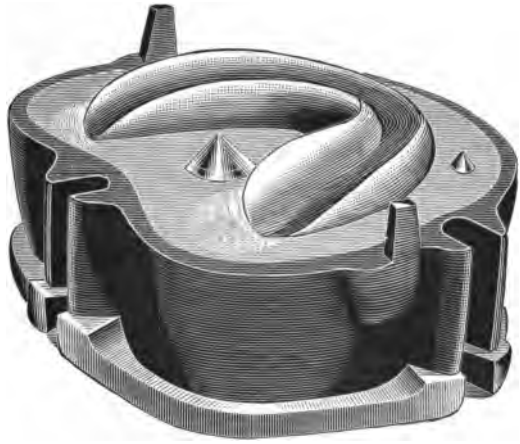


Fig. 8.

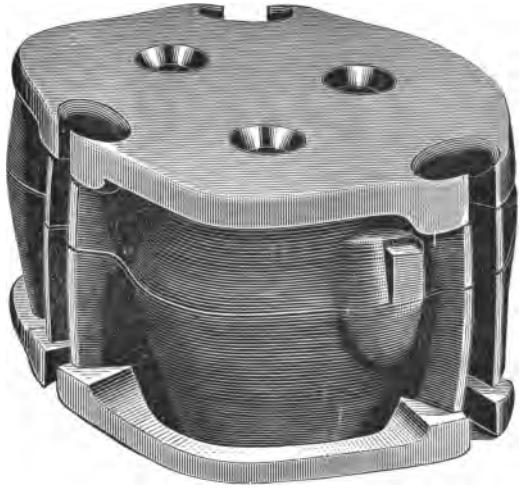


Fig. 9.

The wax may be carved out until that covering the ridge and forming the rim is from 1-16 to 1-12 of an inch in thickness. When duplicated in metal the intervening space between the outer and inner converging rims will be found amply sufficient to firmly dovetail the rubber and metal together.

At this juncture of the operation the investments in the two halves of the flasks should be pressed firmly together in their former positions in order to prefectly reproduce the wax heels of the plate. Before this latter movement it may be well to scoop out a slight depression on the investment just in front of the teeth, as shown at *a*, Fig. 4, which, if moistened and filled evenly with wax, will leave a nipple-like extension to the wax model in the metal flask as shown at *a*, Fig. 5.

Now, the other half of the metal flask should be placed in position and filled with pumice and plaster. (See Fig. 6.) Warm and thoroughly remove wax. Cut pour-hole and vent. (See Fig. 7.) Place the two parts together, on end, and dry till no steam will moisten a mirror when placed over the pour-hole. If the flask has become hissing hot, allow it to partially cool before pouring. The metal should be always melted in a clean spoon or one kept for this purpose, and poured at a slight degree above the fusing point.

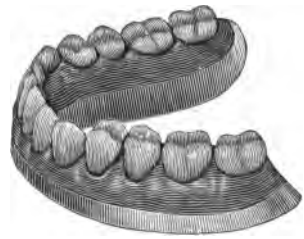


Fig. 10.

The alloys usually used for this purpose are proprietary compounds, and sold in the market as Watt's or Weston's metal.

After removing the excess from the cast thus obtained, it will be found to perfectly fit above the investment of the teeth, as shown in Fig. 8—the heels and nipple resting in the counter depressions which formed the wax model.

Now place the other half of the rubber flask in position and fill with plaster. (See Fig. 9).

When this has been packed and vulcanized it can be as easily finished as an all-rubber denture with a perfect line of demarkation between rubber and metal, and no excess of material. (See Fig. 10).

PATTERNS FOR BACKING TEETH.

DR. R. E. SPARKS.

Dominion Dental Journal.

To save time and annoyance in backing teeth, punch a hole in a piece of stiff paper, sand-paper or light cardboard, (I use sand-paper because it is always handy), slip it over the end of one of the pins and press it gently down upon the other pin. This gives you an impression exactly where the other hole should be made. After punching the second hole, place the paper upon the tooth and with scissors trim it down to the size required. Place the tooth in position, (of course, the tooth should be ground to fit before before backing), and cut the pattern to fit the surface to which it is to be soldered. Then remove the pattern, lay it upon the plate for backings, and mark the edges and holes. The backing can then be cut to the size and shape required, and holes punched with a certainty of being far enough up, low enough down, close enough together, far enough apart, etc.

HOW TO VULCANIZE.

DR. GEORGE B. SNOW.

Dental Advertiser.

After repeated experiments to overcome the effects of expansion of the rubber by heating and the contraction by cooling, thereby causing the rubber to leave the pins and teeth, the following process is given:

To produce perfect results, the mould must contain just that quantity which will fill it when vulcanized, at a temperature so low that it will have no tendency to "flow," or change its shape permanently.

After the mould is packed, it must be relieved of any constraint which will resist the expansion of its contents by heat and cause them to escape.

After the shrinkage incident to vulcanizing has taken place, the mould must be pressed, to force the rubber against the teeth and pins; and this pressure must be continued until the plate is nearly or quite cold.

The results can be attained in an ordinary vulcanizer, but it will be necessary to heat the flask twice. It will also be advisable to use some kind of a spring clamp, possessing power enough to make the rubber flow and re-adapt itself when re-heated. The *modus operandi* will be as follows: Pack the mould with rubber as usual, and close the flask either with bolts or a flask-press, as may be preferred. Before putting it in the vulcanizer, slack off the bolts sufficiently to allow the flask to open when the rubber expands by heat, so that it will not be forced into the gateways. After it is vulcanized, let it cool slowly until there is no steam pressure upon it; then remove the flask, place it in the spring clamp, replace it in the vulcanizer and re-heat it to 320°, and allow it to cool slowly. It is always best to keep the flask in the clamp and under pressure until cold.

In this case the mould contains more rubber than it would if held firmly, by the amount which would have been forced into the gateways by expansion as the heat was raised to the vulcanizing point; and this amount is sufficient, or nearly so, to completely fill the mould while hot and after vulcanization. The rubber is harder and not quite so tractable as when partly vulcanized, and the process requires more care and attention than is required with a vulcanizer capable of pressing the flask at the proper time while vulcanizing; but the operator is thus enabled to test the theory herein set forth, and to satisfy himself of the benefits to be secured by putting it into practice.

This process may be varied by first vulcanizing the plate about three-fourths the usual time; then applying the pressure and re-vulcanizing to finish.

The following precautions must be observed. Any sudden change in the steam pressure may result in the formation of steam in the flask, and injury to its contents; as it is not held together as it usually is. Therefore no escape of steam, by opening the blow-off or blowing out the safety disk, should be allowed. Neither should the vulcanizer be suddenly cooled by putting it in water or otherwise.

It is believed that the results obtained will amply repay the operator for what little additional trouble he will incur in using this method of vulcanizing.

VULCANIZING A FINISHED PALATAL SURFACE.

DR. M. D. L. DODSON.

Items of Interest.

Required, to begin with, tough, bas-plate wax, and No. 60 tin foil. Use the wax for setting up the teeth, and for trial in the mouth, having worked it neatly on the model, keeping hands and everything scrupulously clean. Build on with the melted wax, the rugæ as the plaster model indicates. Invest in lower half of flask as usual. When plaster sets, take a half sheet of the heavy tin foil and burnish down carefully over the surface of the base-plate wax, using, at first, the smooth, rounded end of a scraper handle, or something similar, about half an inch in diameter, followed by a plate-burnisher. Keep out over-laps and wrinkles as much as possible. Burnish nicely and allow the tin to lap just over the grinding surfaces of the teeth to hold in the plaster, when fully invested. Work in the tin between the crowns and in all depressions in the grinding surfaces of the teeth. Trim neatly all around and turn up a flange behind the plate. Now, invest in the upper half of flask as usual. Before parting the flask, warm slightly; and burnish nicely the entire surface of the tin before packing.

Of course, the wax plate must be trimmed and finished before final investment, precisely as it is wanted when inserted in the mouth. The rim above the teeth is to be finished in the usual way after vulcanizing, but nothing will be required to be done to the lingual surface except to remove asperities and trim closely around the teeth.

METAL DIES—CASTING, SWAGING.

DR. D. GENESE.

Ohio Journal Dental Science.

Of all metal for dies used in swaging dental plates, I have found none so reliable as zinc, tin and lead; but these metals want careful handling to obtain the best results.

Always use a large ladle, and plenty of metal, heating up with a brisk fire or good gas furnace. Should the zinc be lumpy or old

and covered with oxide make it a dull red heat before removing from the fire; remove the ladle from the fire to the open air, away from any building or under a draught at a flue; have ready ½ an ounce of hydrochloric acid, and pour it gradually into the hot zinc, (taking care to get to windward of the fumes); have an iron rod to stir the mass, and it will soon be found that the oxide will rise and a clean liquid metal remain at the bottom, keeping bright and flowing for a long time, sufficiently so to return to the workshop and pour without dross or bubbles, and with a smooth, clean surface so dense that hammering gold into it will not bruise the fine surface.

Casting sand should be moistened with water in which a little sugar is dissolved; it binds better and takes a clean impression. The closer the sand is pressed the better will be the impression, but it must be left longer to dry, not in an oven, but on a high shelf in warm air. To prevent air becoming pressed in the bottom, groove the back of the mould thus < and the cast will come out perfect, besides the groove of metal acts as a guide in placing the dies together.

A counter die should be used first of lead, but before using it should be wetted with water and glycerine 5 to 1; this prevents lead sticking to the plate and is better than linen between the moulds. Annealing should always be done before each time of putting the plate between the dies, and all metal plates should be worked bright and never heated without first steeping in the proper acid to remove any particle of inferior metal. A zinc counter die can be made by simply putting French chalk over the die proper.

Tin counter dies give a sharp plate, but are apt to scale and get into the zinc, spoiling its hardness; lead will also do this, therefore always wet the zinc as above, and the plate to be swaged also.

The metals for dies and counters must be kept wide apart and in separate ladles or the zinc die will have soft spots, causing faulty plates.

Metal plates should be carefully cut to patterns, using soft sheet lead for the purpose; the lead foil must be worked upon the zinc die so that it represents exactly what is wanted in the finished plate, and without cracks or rough edges. When this is satisfactorily obtained slightly warm the lead pattern to make it soft and proceed to flatten out; don't crease it but burnish it out with a

round wood point; mark the top that you may know which side to work the gold from and then cut exactly to pattern. Plates can be made with little or no waste, and without cracks or trouble in swaging, as the gold is sure to be exactly the size required.

Plates are better if pressed by screw power press than if hammered with the horn mallet, and the sharp rugæ should be always chased up with bone points, oiled and pressed again after annealing. Investing material should be plaster, pumice and marble dust, equal parts by weight or Teague's impression compound.

PLASTER CASTS.

DR. WM. H. STEELE.

Items of Interest.

Have the following articles on your bench ready for use: 1st, Soap varnish, made by dissolving English white castile soap in soft water to the consistency of milk.

2. Dredge cup. Take a half-pound baking powder can, and have your tinner make a cover for it, having the entire top part made of strainer wire, such as is used on milk pails. Keep this cup always filled with fine, strong plaster.

3. Bottle of mixing solution. Consisting of soft water and two per cent. of alum, or borax, or sulphate of potash.

4. Pepper-box, filled with fine, powdered soap-stone, and a jeweler's extra soft bench-brush.

We will suppose you have a perfect impression for full mouth. Coat the impression with soap varnish, brushing it in thoroughly till a good lather forms; now rinse off with cold water and it is ready to pour. Next pour in your bowl the right quantity of mixing solution, then add the plaster, shaking it in carefully from the dredge cup till it comes a little above the surface of the solution; stir a little. If not thick enough, shake in more plaster, for to have a good, smooth, hard model it should be worked as thick as possible, and it can be worked very thick, as the solution used causes it to set slowly. Now fill the impression slowly, tapping the bottom of the cup to make the plaster settle and drive all air to the surface. When the model is hard enough, separate it from the impression and let it stand to dry. Shake the soap-stone over it

thickly and polish with the jeweler's brush till perfectly smooth. A model made thus, and then before packing, covered with the tin-foil of liquid-tin, gives a plate as smooth as when vulcanized on solid metal cast.

TO REPAIR RUBBER PLATES.

DR. E. HOLCOMB.

First, insert in plaster and scrape down the plate to a feather edge on each side of the crack; then take a thick solution of rubber dissolved in chloroform and place a thick layer where you have scraped; then put on pieces of rubber sufficient for strength and vulcanize. There is no necessity of drilling holes in the plates to let the new rubber through for strength.

RUBBER GUM FACINGS ON DENTAL PLATES.

BY DR. N. MORGAN.

Ohio Journal Dental Science.

The teeth selected should be of such length as to show sufficiently and yet reach so high as not to show much of the gum in laughing. Their length need not be noticeably out of proportion, ordinarily, to attain this end. They may of course at this time be arranged to suit the taste of both patient and operator—perhaps—and if a single set, to harmonize with the occluding ones. A discolored tooth, preferably a lateral incisor, representing a tooth with dead pulp, may at times be interposed with good effect. Where there are but few occluding teeth, improved masticating surface may at times be secured by the use of bicuspids in place of cuspids. These, if suitably modified by grinding, may also make an improved appearance. If the case demands a very thin gum the teeth should be ground to set very close to the alveolar ridge, and in every case their cervical edges well beveled toward the face side. This is to assist in securing even, curved lines of the gum, and also to prevent the tooth margins being chipped in finishing.

The waxing up of the model plates is one of the most important steps in the whole process, and all contouring, and determining

thickness of plate, should be arranged at this time that there may be no excessive amount of filing and scraping later. Before imbedding the case, draw a line on the wax, which shall be precisely what you desire for the upper margin of the gum, and when investing let the plaster come as evenly as possible to that line. Fill the other part of the flask as usual. In opening, warm just sufficiently to avoid any breakage of the plaster, and also retain the trial plate in as perfect a condition as possible that it may be a guide to the amount of rubber required in packing. Cover the model with tin-foil, well burnished. The waste gates must be cut from the posterior palatine portion backward and never in any other portion.

In packing, commence with the base plate rubber and pack about the pins of the teeth till the pins are well covered. Then of the pink rubber cut little oblong pieces, perhaps an eighth or a sixteenth inch in size. These are to be packed between the teeth at the cervical portion, to serve for the gum margins. If the waxing outside the ridge was thin the next step will be to cut a strip of the pink rubber of a width to reach from the other rubber (which covered the pins) to the edge of plaster which fixes the height of the gum. The length of the strip should be sufficient to include the teeth. This should be laid very evenly in place and there carefully covered with a similar piece of the other rubber of a sufficient thickness that the two will at least equal that of the model plate in that portion. It is at times necessary to warm and stretch the dark rubber very thin to attain this result. If the waxing was thick it would be better to use two thicknesses of the pink rubber. If the edges are now found to be above the edge of plaster, they should be trimmed evenly with scissors. The palatine portion may now be packed in the usual manner. The last step in packing will be to fill very evenly, with the dark rubber, the groove around the cast in the other part of the flask. This forms the portion above the gum line and its evenness depends on these lines being made and kept perfect.

These two sections are now to be united and placed in the spring press in such a way that the anterior portion will come together decidedly in advance of the posterior. This is to force all the surplus rubber backward and so prevent displacing that portion forming the gum.

In finishing the plate there will be no danger of exposing the

dark rubber through the facing unless the waxing was such as to necessitate such reduction in thickness. In polishing I first use duck or felt wheels and wet pumice stone. For the cervical portions (which troubles most operators) I use a small stiff brush wheel, with the bristles cut down to not more than one-fourth inch in length, also with wet pumice. Brush mostly from tooth to gum, constantly oscillating the case to prevent forming grooves, and this part will not prove very difficult. The final polish may be secured by means of soft brush wheels and chalk.

If these directions are carefully followed, the resulting plate will present well defined gum lines and there will be no exposure of pink rubber beyond its borders.

GASOLINE BLOW-PIPE.

DR. J. J. REED.

International Dental Journal.

While, perhaps, the largest proportion of dentists have facilities for soldering in the use of illuminating gas, there are still many who are compelled to make use of other and inadequate means to accomplish this work. The following description will, doubtless, be of use to this class.

The blow-pipe consists of a quart bottle with a mouth about one inch in diameter, fitted with a rubber-stopper, the latter perforated by two holes, through which pass two glass tubes, one extending nearly to the bottom of the bottle, the other merely passing through the stopper. Two rubber tubes, about four feet long, are attached to the glass tubes. To the end of one of these is inserted two inches of glass tubing to serve as a mouth-piece, and to the other the ordinary mouth blow-pipe. The bottle is half filled with gasoline.

By blowing through the mouth-piece tube, which should be attached to the tube extending to the bottom of the bottle, the air is made to combine with the volatile properties of the gasoline and passes out through the blow-pipe tube and may be ignited by an ordinary alcohol lamp. It produces an intense heat. If it is desired to increase the size of the flame, all that is necessary is to

use blow-pipes of varying apertures from one-eighth inch down. Care should be used not to blow in the wrong tube, as this would force the gasoline out of the other tube. A foot blower will be found of advantage.

BABBITT METAL—HOW TO MAKE.

DR. L. P. HASKELL.

Ohio Journal Dental Science.

I must emphasize, that what is sold as Babbitt metal will not always answer the dentist's purpose. There are many formulas, some in which lead is substituted for tin, in order to cheapen it, but ruins it for dental use.

If any one wishes to make it for himself, the following is the formula: Copper, one part; antimony, two parts; tin, eight parts, and remember to melt in the order named, otherwise the tin will oxydize badly.

Now, pure lead cannot be used for the counter die because it melts at a higher temperature than the die. Reduce the melting temperature by adding tin. Make it five parts lead and one part tin.

BITE—HOW TO TAKE.

DR. C. H. DUNNING.

Items of Interest.

Here is a never failing method for taking a bite, and it also furnishes a rule for giving the proper expression to the mouth, such as fulness of lip, length of teeth, center of face, etc. Before taking the impression in plaster, take one in wax, and remove from cup by cooling in water, (the object of doing this before taking the impression is to give you a good understanding of the requirements of the impression); place the wax in the mouth again and find where it needs dressing off to give the lips the proper look, and see that it shows just exactly below the lip as you wish the teeth to be seen. By putting some wax on where required, and dressing off in other places, you can see exactly how the expression will be.

Now mark the center of the face, and have the patient bite up several times against the wax, and you will find you can tell exactly where it is correct. Remove the wax and soften it on the surface where the lower teeth struck by passing it through the flame of your lamp, and return to place in the mouth, requiring the patient to again close, watching carefully that they bite in the same place as before and bite into the wax far enough to leave a good impression of the tips of the teeth to articulate with. In articulating put the wax on the model, and fill the wax impression of the lower teeth out even with the fulness of the wax; smooth this carefully, as it is your guide for filling out the face. When plaster is set, take a pair of compasses and measure a distance from the bottom of the wax—that marked the length of the lip—to a line on the plaster above the model, and which attaches it to the articulator. Remove the wax and measure from this line the same as before, and you will find the length for the teeth. In setting the teeth on the model be sure to set them full, with the plaster on the lower portion of articulator, as that is the proper fulness.

I have followed this system for years, and never have a failure on these points. This plan only takes a few minutes, and there is no trying-in, as the patient can see just how the teeth will look from the wax. If for full upper and lower, proceed with lower as upper, and let the patient close the two together, when they can be marked and taken out. The trouble with patients throwing out the chin, is, in most cases, because they close up too far.

DARK JOINTS—TO PREVENT.

DR. C. H. DUNNING.

Items of Interest.

Grind the joints in any way you are accustomed to, and wax up carefully, taking pains not to besmear the blocks on the outside with wax or dirt. Cleanliness is invaluable. After waxing, put the case in cold water, and, after getting cold, trim the wax on the front as nicely as you would the rubber. Invest the case deeply in the flask, bringing the plaster completely up to the top of the wax (rather above than below.) This will leave only the blocks above the plaster on the outside. When you separate the flask, you will

find you can easily get at the front of the blocks, or rather that portion which the rubber will come in contact with. Mix plaster for the joints very thin; flow it in between the joints and plaster. This makes it utterly impossible for rubber to run down the front of the joints, and it is there that it is always found, as every dentist knows. Cut waste gates at the back of the cast only—never, under any circumstances, in the front. Pack in any way you are accustomed to, and warm your flask; screw the front of the flask down first, and force all surplus rubber out at the back. Remember, the whole system must be followed, and each step will explain itself, if practised.

RENEWING ZINC FOR DIES.

DR. FLETCHER.

British Journal Dental Science.

When the zinc used for dies gets thick and unsatisfactory, place it in the melting ladle and heat to dull redness, when a tablespoonful of strong hydrochloric acid thrown on it whilst stirring with a stick or an iron rod, will instantly render it perfectly fluid and equal to new metal.

INVESTING MATERIAL.

DR. W. M. BARTLETT.

Archives of Dentistry.

For investing material, common moulding sand, in proportion of one-half plaster and one-half sand. After allowing the mass to set hard, trim it down to suit the case invested, and then with a hair brush paint the upper surface with a solution of borax water. The advantage of the use of sand as an investing material is, that from the change of the color of the mass from a deep yellow to a lighter shade you can perceive the exact moment at which your case is thoroughly dried out. The borax has the property of preventing the mass from splitting. Its greatest qualities are its strength and non-contractible properties, it having an advantage in this respect to pumice, asbestos and other materials generally used for this class of work.

CROWN AND BRIDGE WORK.

A NEW BING BRIDGE.

DR. JOHN S. THOMPSON.

Dental Cosmos.

The setting of an ordinary Bing bridge between any of the oral teeth is both troublesome and unsatisfactory because of the difficulty of building the wings into the natural teeth. It has therefore occurred to me to make the backing and wings in a single separate piece, which can be first anchored in the abutment teeth, and the bridge-tooth be then fastened to the backing.

The illustrations will aid in making the method obvious. Fig. 1 shows the backing and wings for a porcelain central,—in

FIG. 2.

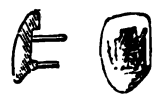


FIG 3

FIG. 4.

FIG. 5.

this instance the How four-pin crown (Fig. 2) is employed, and put in place with the wings extended into the prepared cavities in the natural central and lateral. It will be seen that a hollow or walled-in backing has been made, and pin-holes punched to receive the pins of the crown, which has been ground and fitted so as to exactly fill the space between the teeth and rest closely on the gum. The backing, however, does not quite touch the gum. The rubber-dam is put on the adjacent teeth, the How crown and its backing put in place as in Fig. 3, and some softened modelling composition pressed carefully against the backing and the backs of

the anchor teeth, being careful to keep the warm composition away from the rubber-dam. When the composition has become quite hard, and while it is held with the fingers firmly in place, press some softened modelling composition over the face of the bridge-tooth and its neighbors, and when the composition has become quite cool remove it, and the bridge-tooth with it.

Still retaining the inside piece of composition, and with the fingers holding it firmly in place, the wings of the bridge may be built in with gold on the labial sides of the cavities, to which this method affords free access. After those sides have been filled, the bridge-tooth is to be put in place, the outside piece of composition put on, and the inside composition carefully taken away without displacing the backing, which will then be firmly supported by the outside composition, as is shown by Fig. 4. The palatine walls of the cavities may then be filled with gold to surround and secure the wings of the bridge. When this has been done, the ends of the crown-pins may be bent down on the backing and the bridge-box be filled with gold, or with gutta-percha, or cement. The external appearance of the case will be like that shown by Fig. 5.

The advantages of the method are a clear view of and complete access to both sides of the cavities while building in the bridge-backing, and the readiness with which another crown can be fixed on the backing in case the first one should be inadvertently broken or forced off. The mounting is so solid that this is not likely to occur; but in the single instance of my experience the second crown was very quickly and firmly attached.

STRENGTHENING GOLD CROWNS MADE FROM THIN METAL.

DR. GEORGE EVANS.

Ohio Journal Dental Science.

Some prepared filings are carried in a dry state with a spoon-shaped excavator, and packed in position in the cusps or placed on any desired spot. The crown is then held in the flame of an alcohol lamp and slowly heated to a cherry red, which is sufficient to fuse the filings, which will melt down exactly where they have been placed. During the process, the crown should be grasped on

one side, at the extreme edge of the collar, between the points of small tweezers, and held in such position as to present a full view of the inside. The melting of the solder is thus instantly seen, when the crown should be quickly removed from the flame. If it is desired to strengthen the sides of the crown also, the surface of the interior is first dampened with a piece of cotton moistened with water on the end of an instrument, and a quantity of solder filings placed in the crown and shaken around against the sides. A portion will adhere evenly all over the damp surface, and the surplus is then dropped out, the quantity required placed in position, and heat applied as described, when the solder will be fused evenly over the surface of the gold without melting the sides or materially changing the general form of the interior of the crown.

TO EXPOSE THE END OF A ROOT FOR CROWNING.

DR. THEO. F. CHUPEIN.

Dental Review.

Ream out the canal partially, take an ordinary tack, build gutta-percha around its head, heat and press into the canal; then with a burnisher spread the gutta-percha over the end of the root till it passes over the margins. At the next appointment the root will be free to work at.

AN IMPROVED RAPID METHOD OF CROWNING ROOTS.

DR. R. P. LENNOX.

Journal British Dental Association.

In pivoting a tooth the root is prepared and the apex sealed in the usual way, care being taken not to make the canal larger than ordinary pivot wire until after the cast is taken. A cast is now taken of the mouth and a canal drilled into it to correspond with the root canal, the direction of which may be obtained with sufficient accuracy by observation merely, no special tray being neces-

sary. An opening is also made in the front of the cast about a quarter of an inch from the edge of the root so as to meet this canal. The purpose of this opening will appear later.

An ordinary flat tooth of suitable size and color is now ground to the model, and a back prepared for it in such a manner that when the tooth and back are placed in position upon the model, the back will exactly cover the centre of the root canal. The tooth and backing are then waxed to the model from the front, and a strip of very thin plate, rather broader than the tooth is deep, is bent round into a band to fit the root and backing. This band is next soldered to the backing in such a way that its extra width leaves a certain trifling margin at the lower edge, by the cutting away of which the tooth and band can be let down on to the model like an ordinary tube tooth. This being done, the upper edge of the band is next clipped and filed to the shape desired. A pin, which is best made of platinum wire, is next prepared, and a slot sawn in it lengthwise from the end which is to be outermost in such a manner that, when the pin is in position in the cast, and the tooth and band are applied, the backing of the tooth fits readily into the slot in the pin, which may, of course, be bent a little, if necessary.

This adjustment being made, the tooth is removed from the cast with the pin in position on the backing and the two are then soldered together. In making this removal, it is obviously necessary not to disturb the position of the pin, and the opening made through to the canal from the front of the cast will enable the removal to be made with the desired result. Lastly, a groove is filed in the side of the pin, which will ultimately lie towards the inside of the mouth. The whole is then finished in the usual way and annealed, but not boiled in pickle, because the mercury of the copper amalgam to be afterwards used in the mouth, will not act so readily upon oxidized solder. As a further precaution, the soldered parts may be coated with copal ether varnish. A trial is now made to see that the position is right, and the flat tooth is permanently attached to the backing by merely bending the pins.

The whole is now ready to be applied to the mouth. To do this, place some soft copper amalgam under the front part of the tooth and press the tooth into position on the root. On the tooth being withdrawn, the amalgam will be found adhering to it. Some

suitable white-stopping is now put into the canal and the tooth again pressed firmly into place. Then the white-stopping is packed nicely round the pin and all that is superfluous carefully removed. Finally the band is filled up with copper amalgam by taking a very small quantity of soft to begin with, and packing it with a small piece of amadou, then squeezing the remainder of the amalgam in a napkin, building up with it and finishing with amadou. The work is now complete.

SOLDER FILINGS.

DR. GEORGE EVANS.

Ohio Journal Dental Science.

The prepared filings are made from a thick piece of solder grasped in a vice, with a clean flat-plate file. The filings are allowed to fall into a box or upon a sheet of paper, and a magnate is passed through them to remove any minute particles of steel detached from the file. To five parts of the filings is added one part of Parr's prepared flux, or of finely vitrified borax. Solder prepared in this way is useful in fine soldering work of all descriptions; it is much to be preferred to solder cut in pieces, as the fine particles separately take up the heat and fuse more readily, also under better control.

GOLD TIPS.

DR. V. H. JACKSON.

Dental Cosmos.

In making tips for abraded teeth, to lengthen them, or to avoid pulp-exposure by abrasion, the method I have used for years is to take pure rolled gold, about 480 foil; cut a piece a little larger than the face of the tooth to be tipped; place it on the tooth with a piece of erasing rubber over it; let the patient bite hard on the rubber; anneal the gold and repeat the bite. In very uneven surfaces I sometimes have to use a small piece of elastic rubber underneath the erasing rubber. This gives a perfect swage. Cut a piece of solder (20-k.) the size of the swaged gold; lay it on a

strip of the gold you use for the tip; lay the swaged gold on the solder and fuse the solder. If proper care has been used, you will have a perfect fitting tip. Drill two or three holes through the tip in positions to pass between the pulp and periphery of the tooth on a line with the axis; in these holes put platinum pins and solder. Trim as near as may be to the form you wish it when finished. Cement to the tooth, burnishing the edges well, then grinding and polishing to the finish. Any thickness can be built up that is desired.

COUNTER DIES FOR SWAGING CUSPS FOR GOLD CROWNS.

DR. C. H. ROBINSON.

Dental Review.

Make of sheet brass, using hard solder, a cup three-fourths of an inch in diameter and half an inch deep, having a spur on one side by means of which it can be held in a pair of pliers; fill it with Melotte's fusible metal. Select a natural or an artificial tooth for a model; fill the soft rubber ring that comes with Melotte's Moldine with plaster, and invest the tooth so that the cusps project out of the plaster as far as it is desired to copy them; when dry remove the rubber ring. Melt the metal in the cup, and just before it hardens in cooling, press the cusps of the tooth into it. The surplus metal will run over the sides of the cup, and a sharp and perfect counter-model will be secured, into which the gold plate can be swaged after the method of the S. S. W. die-plate, using the lead hubs or bullets. I also use for this purpose sheet lead 1-16 of an inch thick, cut in strips $2\frac{1}{2}$ inches long and $\frac{1}{4}$ to $\frac{1}{2}$ an inch wide, one end of which is folded upon itself two or three times letter S fashion, the other end being long enough to hold it by. As it becomes flattened in swaging, it can be folded back and forth over the gold plate.

By having one or more of these cups and a sufficient selection of teeth already invested in plaster, it is but a moment's work to select the size desired, and make the counter-die. Should it lose its finer lines in swaging, it can be remelted and an exact duplicate obtained in less than a minute.

A SIMPLE METHOD OF MAKING A PIECE OF BRIDGE-WORK.

DR. W. N. MORRISON.

Dental Review.

Prepare the teeth or roots that are intended for anchorages in the usual way; make gold caps or crowns to fit over them. Make the gold crowns either with gold or porcelain cusps. Place the gold caps on the anchorage teeth, and take an impression in plaster or modelling compound. If the gold caps do not come away with the impression, take them out of the mouth and place them in their right position in the impression and cast the model in plaster. When taking the impression take two of them; one with the gold caps on the anchorage teeth, and one without. Make a model from the last named impression for use later on.

Take a strip of wax about 1-16 of an inch thick and the width of the ridge, or as wide as the case should be when finished, place it on the model, reaching from one gold cap to the other. Place on this wax a piece of gold plate sufficiently heavy to give the necessary strength, and long enough to reach from one gold cap to the other, and folded at an angle thus—L—its entire length; curved longitudinally to conform to the bend of the ridge. Place this gold angle bar so that the outer edge of one angle will point toward the labial surface or cheek, and the other edge of the angle toward the top of the piece. Now invest this and solder each end of the gold angle bar to its respective gold crown or cap. This should now be tried in the mouth, and any correction that may be necessary to fit it can be made.

It will be found that the gold angle bar will be raised a slight distance from the ridge. Take the new model and place the skeleton on it, use gum or plain teeth, the same kind as are used for rubber work, wax up the piece same as for a rubber plate, covering up the gold angle bar entirely and allowing the wax model to rest upon the ridge. A slight groove running around near the edge of the piece on the plaster model will leave a corresponding ridge on the finished piece, which will prevent seeds or particles from getting under the plate. If there should be any shrinkage of the gum, the piece can be kept clean underneath, as then access can be had to that part. If no shrinkage takes place, experience has taught us that no bad effects follow placing the piece firmly on the gum.

PREPARING ROOTS FOR CROWNING.

DR. A. G. PERRY.

International Dental Journal.

It seems to me that as fine a joint cannot be made with any sort of a cap that can be put upon a tooth as is the joint made by putting a gold filling on the end of the root. Finish the filling perfectly, then set the crown on that, and the operation will be as lasting as anything that can be made. In that way the root can be saved, and if anything breaks it will be the crown, which should always be the weakest, and which is easily replaced. If I set a thimble, as of course it is necessary to do on a frail root that may split easily, I bevel the end and having fitted the band, cap and pivot, and having soldered the three together, drill one or two vent-holes through the cap. After this thimble is set, fill the vent-holes with gold and then proceed to fit and set the tooth on the projecting pivot. When the tooth is set in this way, the excess of zinc phosphate does not go down between the band and the tooth at all, but comes out through the vent-holes drilled through the cap, and allows the whole structure to go to its intended place.

CROWNING WITH PLATE, RUBBER OR COUNTERSUNK TOOTH.

DR. A. H. STODDARD.

Archives of Dentistry.

This crown resembles a Logan in the fact that it is a tooth with a platinum pin baked into it; an ordinary plate, rubber, or countersunk tooth may be used for the purpose, preferably the latter. The root is prepared as for an ordinary Logan crown, and a platinum pin placed in the canal, and an impression is taken; a small plaster model is then made, leaving the pin in the model in the same position as in the root; the model is shellaced and oiled slightly, and, if a rubber tooth is to be used, it is placed in position and body (such as is used for carving) packed around the pins and over the end of the root, and trimmed to the desired shape and size; it can then be removed and baked in a gas furnace in a few minutes. The method of using a countersunk tooth is slightly

different: The countersunk portion is filled with soft body, which is pressed down on the model with the pin in position; the soft body conforms perfectly to the end of the root, and the pin to the direction of the canal: it is then trimmed, removed and baked, and is ready for insertion without grinding. The advantages of this method are obvious: the crown has the same diameter as the end of the root, and conforms to its contour perfectly.

TO ADAPT A LOGAN CROWN.

DR. W. L. REED.

Archives of Dentistry.

Take White's thin articulating paper, cut a disk a little larger than the circumference of a Logan crown; pierce the center of disk with pin of crown; place on the root with firm pressure and it will show the point of contact so a perfect joint can be obtained.

GALVANO-PLASTIC CROWNS.

DR. WM. H. STEELE.

Items of Interest.

By this process, crowns can be produced true to nature in every respect. Besides this, the electro-process will be found very useful in many other kinds of laboratory work. A small Daniell or Smee battery, large enough for the work, can be bought for from one dollar and fifty cents to two dollars, which includes jar for solution, connecting rods, battery wires, etc. Instead of casting the crown in fusible metal, use a preparation of best wax, mixed with one-twentieth its weight of flake white. Put the wax into an earthen dish, over a slow fire, taking care that the heat is just sufficient to melt the wax. When quite liquid put in the flake white, and stir thoroughly with a glass rod; when fully mixed, pour out on a clean plate, and when cool chop it in small pieces and re-melt it; re-melt the mixture once more, then it is ready for use. Next select a natural tooth or porcelain crown, the shape and size of the one you wish to make, oil it lightly, and make from it a two-piece

plaster mold. When the mold is sufficiently dry, oil the inside lightly with sweet oil, taking care that the oil penetrates all parts of the mold. Place the two parts together and wind a piece of wire around them to hold them together, leaving it long enough to serve as a handle. Having melted enough wax for the patterns, heat the mold over a gas or alcohol flame until it is just warm enough to prevent the wax from being suddenly chilled when poured into it; but it must not be hot enough to dissipate the coating of oil with which it has been covered. Hold the mold in the left hand slightly tipped, that the melted wax may flow over the surface evenly and gradually.

It is a good plan to pour at night and let stand until morning. When solid, separate the mold and remove the pattern. The tooth pattern should now be fitted into the space furnished by the bite. This work should be carefully done with a wax spatula (or any other instrument) by scraping and smoothing with the warm spatula. In fitting for length, leave the pattern as much longer than the bite, as you may wish to have it go down on the root. To fit for root measurement, set the pattern on the prepared root and trim to exactly the size and shape of the root. The crown itself must be enough smaller than the space it is to occupy, to allow for the thickness of the gold crown ; connect the pattern with the battery to see the latter in action. Supposing you are using a single-cell Daniell: Pour the sulphate of copper solution into the outer jar until it reaches within an inch of the top; place the porous cell in it; pour the acid solution into the latter, being careful the two solutions are level with each other. Next, slightly warm the negative wire—which is the one leading from the zinc of the battery—and press it into the neck of the tooth pattern, being careful not to let it prick through to the masticating surface. When cool, make the electrical connections between the wire and pattern continuous by black-leading the point of junction thoroughly. Bend the wire in this shape ∩, so that the tooth pattern will come opposite the middle part of the zinc battery plate, and as near to it as possible. Immerse the zinc in the porous tube, and, if necessary, bring the pattern nearer by bending the ∩ wire. A little muslin bag of crystals of sulphate of copper should be suspended in the copper solution. The deposition does not commence at once; when it does, it goes on continually as long as any is generated. The pattern may

be lifted out at any time and examined, as long as it is not touched with the fingers. I would advise anyone buying a new battery to get the Smee, as it is convenient, cleanly, and better for general purposes, and the battery power can be increased or diminished as desired for different kinds of work. To operate the Smee, the sulphate of copper solution is put in a separate glass jar. The battery is charged with dilute sulphuric acid, the same as for the Daniell. Be careful that the screw posts, wires, and rods that come in contact, are kept clean and bright, or the battery current will be greatly enfeebled. Suspend the pattern from one of the rods, and connect the wire from the battery zinc with it. The wire from the platinized silver is connected to the other rod, and a piece of copper, twice the size of the article to be plated, must be suspended from this rod. The copper plate and pattern should be hung in the copper solution in a position exactly facing each other, and about one inch apart. It is not necessary to hang the bag of copper crystals in the solution as with the Daniell, for in this battery the copper plate or anode supplies its place. When the copper is thick enough, remove from the bath, and clean thoroughly by washing it in clean soft water. The pattern is now ready for the gold deposit. Exchange the jar of copper solution for one of gold; remove the copper anode and put in its place one of gold, the same size. It will take from twelve to fifteen hours; the time will depend on how well the battery works, and the thickness of the crown; but as it only requires occasional attention, the time is of little consequence. When the gold is thick enough, remove from the bath, wash, buff, and polish. When finished hold the crown in hot water until the wax pattern melts and runs out of the gold shell; the crown is ready to fit and mount.

Battery Solution: The acid solution for exciting the zinc is made by mixing one part sulphurie acid with twelve of water, care being taken to add the water last, and pour it in very slowly, otherwise so much heat would be generated that the mixture would boil over and spatter the hands and clothes.

Copper Solution: Pour a pint of boiling water on a pound of sulphate of copper; the mixture must be well stirred with a glass rod, in order to dissolve as much as possible of the salt. When perfectly cold, pour off the blue liquid, and add to it one-fourth its bulk of the dilute sulphuric acid which had been prepared for the

battery. The latter is added to increase the power of the solution for conducting electrical currents, as it is a better conductor than either the water or copper. It will be found much cheaper to buy the gold solution of some dealer in electro-platers' supplies, as it is difficult to make, and expensive to spoil.

MAKING AND SETTING CROWNS.

DR. S. S. STOWELL.

Ohio Journal Dental Science.

The root is prepared in the usual way and the pin and cap of metal carefully measured and adjusted. The pin in the crown, if it be a Logan, is next cut off, with the exception of a small piece that is allowed to remain. The crown is next ground and fitted to the cap over the root, after which it is removed and gold melted into the undercut and around the pin, the metal being spatted down while in a state of fusion, which forces it to every part and produces a flat surface. The crown is again ground to fit the cap, and afterwards soldered to it, thus producing the most cleanly crown it is possible to make. It is cemented to the root in the usual way.

SIMPLE METHOD OF CONTOURING A CROWN.

DR. E. B. WHITE.

Dental Cosmos.

The simplest and quickest way of making a contoured crown, after having perfectly fitted the band to the tooth, is to hold the band between the thumb and index finger of the left hand, with the cusp end outward, and insert the narrow beak of the half-round pliers a little more than half way, gently but firmly pressing outward with the end of the beak, at the same time drawing inward with the other beak, and by going carefully around the band in this way it can be very readily bulged at and on either side of the center, and contracted at the cusp end, thus giving a natural contour. The end is then faced by holding it on the side of a corundum-wheel. A piece of platinum about No. 35 is cut a little larger than

the end of the band and made flat, and four globules of the same metal used for the band, are placed upon it in proper position to articulate with the occluding tooth, and fused until the platinum is covered, but not enough to level the mass of metal, which should remain prominent for the cusps. Then a small oblong piece of the same metal should be attached across each end of the now formed cusp plate, the platinum ground off with a corundum stone, the flat side held up with the pliers, and the surface end of the band placed upon it and united by placing a small amount of solder with flux in the center and holding in a Bunsen flame. The cusps are then carved with suitable burs, and burnished after smoothing the edges of the cusp plate.

REPAIRING BROKEN BRIDGE WORK.

DR. W. MITCHELL.

Dental Review.

First supposing that the backing and flushing is of a substantial nature, cut off any projecting pins that may be remaining, then with a suitable corrundum point in the dental engine, grind off remainder of pins and sufficient of the backing to remove any convexity of surface that might remain at that point; this is to allow the new tooth to fit close to the backing, and to remove any strain, as it is always the greatest just there.

Select a suitable tooth, which must be one of Ash & Sons' (as American teeth do not possess the requisite length of pins, besides possessing the disadvantage in this case of having said pins alloyed with iridium, which would render them much too stiff to work well. The next step is to find where the pins are to penetrate the backing; drill the holes with a spear-pointed drill lubricated with glycerine or vaseline. This will simplify this otherwise tedious process. After the tooth has been let down nicely with a fine fissure bur, lubricated as before described, cut two grooves laterally, just beyond the pinholes, on the palatal side of the backing, extending beyond the pinholes vertically, and then with the right angle carrying an inverted cone bur of a suitable size, remove sufficient of the backing between the lateral grooves to form, as it were, a small dovetailed box. Replace the tooth, then with a suitable instrument (I

use a pair of curved excising forceps) bend the pins together, the ends passing each other, drawing them firmly against the bottom of the recess; pack with soft, quick-setting amalgam, and polish when set. In some cases a small amount of oxyphosphate between the tooth and backing will be found an advantage.

GOLD CROWN.

DR. A. W. M'CANDLESS.

Dental Review.

Trim the sides of the root parallel, draw a strip of platinum around the root with a pair of pliers, remove and use as a measure, cut a strip of gold of the same length and of width sufficient for height of crown, draw the ends together and solder.

Drive on the root and it will take the shape of it. With Melotte's modelling compound take an impression of the cusps of an adjoining or opposite tooth. In this pour the metal for a model. Cut a piece of gold for a cap, lay on a bar of lead, place the model on this and drive into the lead. Fill the cusps with solder and grind to fit inside the band.

With the band on the root, the gum margin may be marked and the band trimmed to correspond. A bite may be taken in wax and all placed in the articulator. The cap can then be adjusted and the proper occlusion secured; then solder the joint and polish.

SWAGING CAPS FOR GOLD CROWNS AND BRIDGES.

DR. C. S. CASE.

Ohio Journal Dental Science.

Imbed a natural tooth in a section of gas pipe about an inch long and three-fourths of an inch in diameter, with moldine or plaster of paris, so that only the crown surface and so much of the lateral surfaces as may be desirable are exposed; a piece of rubber tubing is then placed over the cylinder containing the tooth so that it extends one-half inch, or higher if desired, above the crown; into this is poured Babbitt's metal or any fusible alloy that is sufficiently

hard to endure the swaging without changing form. This secures a matrix mold of the natural crown. To swage the gold cap, a piece of gold of required size and thickness is laid over this matrix and driven into it by a piece of lead. The method is very similar to swaging caps on the ordinary die plate, but it has the advantage of securing any sized cap that may be needed, and a greater variety of shapes. Of course, it involves keeping near at hand a large assortment of teeth with which the matrix may be made.

THE SETTING OF PORCELAIN AND OTHER CROWNS.

DR. S. B. LUCKIE.

International Dental Journal.

The Bonwell crowns are sufficient to meet the requirements in a large majority of cases, and their construction and method of attachment have been frequently explained by Dr. Bonwell. There are some additional points, however, which, I think, may well be considered. After the root is prepared, to prevent splitting it, a small groove should be cut around the canal, between it and the cement, which, when the pin is adjusted, the root filled, and the crown pressed to place, will solidly fill with amalgam and support the root on all sides.

If it is a root in the anterior of the mouth, the exhibition of a discolored joint may be prevented by placing a small quantity of light-colored gutta-percha, softened by heat, around the edge of the concavity of the crown, and at once adjusting the crown. A tight joint will thus be made, which will prevent the showing of the amalgam externally. Any excess of gutta-percha which may have been forced out should be trimmed off flush with the root and crown.

If a case presents where decay has progressed to such an extent as to leave only a funnel-shaped cavity, and but little substance for retaining the pin near the apex, a thin plantinum band should be placed around the root, with a strip from it, to be turned and burnished into the cavity, to prevent the band from slipping beyond the edge of the gum. Then close foramen, select a small probe—a Gates canal-drill with bur broken off answers well—and

insert it in the root and pack amalgam around it; using either the Bonwell or the electric mallet to work the mercury well to the surface, removing the mercury with a piece of bibulous paper, and so manipulating the amalgam as to have it hard by the time the filling is completed. Then withdraw the probe; this leaves a canal that answers well as a guide in drilling. You now have a root almost as good as if it had not been injured by decay, and the operation can be continued after the usual method.

When the root is perforated in one or more places, I use a piece of plantinum foil, cut into a shape that may be adapted to the walls of the canal, as a lining. For success in the use of these crowns, it is important that an amalgam of great strength be used; for, with inferior amalgam, the permanent building up of badly disintegrated roots is impossible. Low grades of amalgam are also subject to discoloration, which may be apparent through the porcelain, and they are therefore objectionable.

Experience has satisfied me that the attachment of these crowns to roots with amalgam, and a pin whose surface will amalgamate, is the strongest method that can be used; and so great is my faith in it, that I take advantage of the mechanical principle in building contour fillings of amalgam in bicuspids and molars.

Sometimes the articulation will not allow a porcelain crown of sufficient strength to be used. The inferior lower and upper laterals frequently have roots so small as to prohibit the adoption of this method. For the roots of such teeth I prefer a platinum and iridium pin for the canal. A gold collar is made to fit around the root and beveled on the labial surface beyond the free margin of the gum. A gold plate soldered on the beveled surface of the collar makes a cap for the end of the root. Adjust the cap on the root, select a suitable plain plate tooth and back it with gold, fitting it on the cap and attaching it with rosin and wax. Remove the tooth and cap; invest and unite with solder. After polishing the piece, attach it to the root with oxyphosphate of zinc.

For the roots of bicuspids and molars, a very permanent crown can de adjusted by making a cylinder of gold to fit the root, and allowing a filling of amalgam to extend from within the root through the cylinder; using a composition pin to strengthen the attachment.

Gold crowns can be adjusted in the same manner as the por-

celain crowns, and a beautiful operation can be made, the amalgam being entirely hidden from view. A crown of this description is made by taking a ribbon of coin gold, number twenty-eight American gauge, and forming it into a cylinder shaped at one end to fit closely the root. An articulating face is made by taking a piece of gold plate, wider than the diameter of the cylinder, and placing on it small, square pieces of gold, making pyramids according to the number of cusps required. The plate is held in the flame of a blowpipe, to solder the pieces together and to the plate, using an eighteen-carat solder. Now flow a solder of a lower carat on the opposite side of the plate, place the cylinder on it, and again hold in the flame till the solder reflows. The excess of gold is cut off, the cusps filed to their proper shape, the crown polished and filled with a plastic.

After the plastic has become hard, concave the base, drill the number of holes needed through the crown to its articulating face, and countersink the holes. The crown is now ready to be attached to the root. If, when adjusting the crown, any difficulty is experienced on account of the pins not adapting themselves, the holes can be made larger with a bur. After the crown is adjusted, the amalgam on the articulating face can be cut away and gold filled in its place, making, to appearance, an all-gold crown.

If a root be even with the gum, the gold can be made to encircle it. This is done in a very accurate and quick manner, by placing a soft steel wire, No. 27, around the root, and twisting the ends together till tight; then, burnishing the wire into the irregularities of the surface of the root, removing it and placing it on a block of soft but tough wood, and striking it with a flat hammer. You now have the exact counterpart of that portion of the root you wish to place the gold around.

TO SET THE HOW FOUR-PIN CROWN.

DR. G. W. DENNIS.

Dental Review.

The How four-pin crown has been in use for several years by me, and gives great satisfaction when set in the following manner: It will be remembered that the pins are long and are to be bent

around a post, which is by the inventor intended to screw into the root. Instead of this I use a flat or three-sided post, enlarge the root at orifice as much as it will bear, and sloping to follow the shape of the root, enlarging but slightly at the last third. The tooth is nicely ground to fit the root, and to occlude properly with its antagonist; the post sharpened, slightly barbed, cut proper length, and marked, the pins are then bent tightly and fastened to the post with a small quantity of solder. If a band is used it is now adjusted and the crown fitted to it, a small quantity of oxy-phosphate inserted within the upper third of the canal and the post pushed entirely up to place and held there until the cement sets; then a plaster investment is formed over the adjoining teeth and the crown itself. This will harden sufficiently in two or three minutes, when the surplus cement, if any, is removed with delicate instruments and a good quality of amalgam forced up into the root, and the lingual surface of the crown faced up with the same. This will be polished, of course, at a subsequent sitting.

A SYSTEM FOR CONSTRUCTING PORCELAIN FRONT CROWNS.

DR. C. S. CASE.

Dental Review.

I think I may truthfully assert that a large majority of the profession are united in their approval of the band or ferrule extension around the root; but always with the provision that it be made according to exact principles and requirements, *i. e.:*

(1). That the peripheral surface of the root be so shaped as to make it possible to fit a band which will leave no V-shaped space between root and metal that cannot be closed by subsequent burnishing.

(2). That the band extend beneath the border of the gum only so far as to subserve the purposes of strength and prevent the lodgment of food along its edge.

(3). That the material of which the band is made be thin enough and of a quality which will admit of easy and perfect adaptation to all inequalities of the root.

In preparing the face of a root for a "Richmond" crown on

any of the six anterior teeth, a most common method is to cut the root squarely off and bevel it anteriorly even with, or below, the margin of the gum. (See Fig. 1.) To the cap which is made for

Fig. 1.—Side View.

this, a backed porcelain face is fitted and soldered. The objections to this method will be seen, I think, as I describe in detail another method of making a cap, which will be found in practice easily constructed, well adapted for every requirement, and of more universal application.

Dress the face of the root in conformity to the curved border of the gum, as in Fig. 2; the labial edge slightly beneath the gum,

Fig. 2.—Front View.

while the palatine may be cut only to the palatine prominence. After the enamel has been cleaved off and the peripheral surface of the root prepared, make the ferrule or band (preferably of pure gold) sufficiently long to hang down from the root—when adjusted to place—about one-half the length of the required crown. Mark on the outside the festooned border of the gum. Remove and cut out a scallop, front and back—on the front even with this line. Readjust and dress down with a corrundum stone until the edge of band and root, anteriorly, are slightly beneath the margin of the

Fig. 3.—Front View.

gum. The proximate extension of the band being left—as in Fig. 3—to fall along the sides of the porcelain face.

Now bend a piece of platinum, no thicker than writing paper, into this curve before or after removal of the band; solder, trim off

surplus and finish. (See Figs. 4 and 5.) You now have an impervious cap, the peculiar shape of which offers the strongest possible mechanical attachment to the root; one which is out of sight from the front when properly fitted with a crown, and, what is of more

Fig. 4.

Fig. 5.

importance—in so far as it tends to limit the bewildering variety of modes—one which can be easily and successfully used as a base for the so-called "Richmond," the Ash, Case and Logan crowns.

When the cap, having been made, is placed in its position on the root, its labial border should fall slightly beneath the festooned margin of the gum. Take bite and an impression in plaster of the immediate section and make antagonizing models, with the cap in position on the model. You are now ready to fit—at the laboratory lathe—the porcelain tooth for any of the above named crowns. It is perhaps needless to say, in all instances where the cap is not drawn off with the impression, it is removed from root and placed in position before pouring.

A prominently unfortunate and deleterious obstacle, from a hygienic standpoint, has always existed with crown, bridge and metal plate dentures, because of the exceedingly unpleasant possibility of food and decomposing substances finding lodgment in the unavoidable spaces where porcelain has been held mechanically against metal surfaces by pins and solder. This, I am happy to say, can be obviated by the use of what is popularly known as "Jewelers' hard enamel," a material similar to that which has been used from very early times in various processes of enameling jewelry, etc. It is principally composed of an easily fusible silicate, or glass; the white opacity and different colors being produced by the addition of metallic oxides, a full description of which may be found in any encyclopædia.

I first experimented—as you may do in the absence of something better—with enamel broken from old watch dials and ground to an impalpable powder. When this is mixed with water into a thin paste and used as an imbedment or luting between backing and

tooth, and in all spaces where porcelain and metal come in contact, the subsequent heat required in soldering will fuse the enamel, and not only form an impervious stopping against the ingress of secretions, but add greatly to the strength of attachment.

For the so-called "Richmond crown" select porcelain face, and back with enamel as above, leaving the pins extended, if desired, to grasp post. At this point solder may be flowed around pins, to fuse enamel and prevent displacement during the grinding and fitting process. Another way, and one which I think I prefer, is to cut the platinum backing a trifle larger than the porcelain face. Dish it slightly, fit, and bend the pins so that it will be drawn closely to place. Now, when the moistened enamel powder is laid upon the extended edges of the backing, and the piece tapped lightly, it will readily penetrate and fill the space beneath, at which juncture it may be fused without soldering, either under a blowpipe or, preferably, in a gas furnace. (For all purposes of this work I am pleased to recommend "The Parker Improved Gas Furnace.")

Now grind face to fit the cap on the antagonizing model—allowing the proximate extensions to fall along the sides of the backing, and the cervical margin of the tooth to stand slightly in

Fig. 6.

front of the cap; subsequently rounding and finishing the edge to the band.

By all means do not follow the slovenly practice, which is altogether too commonly pursued, of leaving a sharp, prominent edge of tooth to force its way into the gum, with a V-shaped space behind for the lodgment of food and final irritation and absorption of tissue.

Finally prepare root canal, replace cap on the root and punch hole for post—place parts in position—secure with plaster, remove and solder. (See Fig. 6.)

Another method, and one which will be found quite as satis-

factory, is to prepare the root-canal and take plaster impression with post and cap in position; also a bite in wax; afterward being guided entirely by the plaster model of adjoining and antagonizing teeth, in fitting and soldering the crown to its proper relative position. Again, the post may be soldered to the cap before the impression is taken. In either way an undoubtedly perfect plaster model must be made, in order to correctly align and antagonize the crown without further access to the patient till the work is completed.

If for a long bite crown, requiring much material to bring the posterior surface even with the surfaces of proximal teeth, a shell may be struck up, fitted and soldered to the adjoining edges of cap and backing, with less work and material, and with the production of a crown of natural contour and sufficient strength—the peculiar

Fig. 7.

proximate elongations of the cap being well adapted for this mode of procedure.

The Ash & Sons' tubed teeth, which are little used in this country, are admirably adapted for all long bite crowns, being exceedingly strong and of a material which admits of reshaping and polishing in any part without injury to the surface.

The impression having been taken and antagonizing models made with the cap in position, as described, the proper tooth having been selected, it should be ground and fitted with great nicety to the curved surface of the cap—the proximate extensions falling along the sides to strengthen the crown and prevent rotary motion. While in position, mark and bore hole in cap for post, (clasp metal), which should be drawn to exactly fit tube in tooth. Adjust cap to root and bore through this hole into canal—remove cap and, being

guided by the marking, prepare root for post. Replace cap, tooth, and post, and, if necessary, bend the post so that the tooth takes its proper relative position. With cap and post in position, secure with plaster—remove and solder them together where the post passes through the cap. (See Fig. 7). The tooth is now adjusted and finally fitted to cap—the post and surface of cap roughened to secure a firm attachment of the enamel in which the parts are finally luted to place and brought to the required heat for fusing. (See Figs. 8 and 9.)

If the enamel is finely pulverized and mixed to the proper consistency when laid over a crevice with a camel's-hair brush and the tooth tapped lightly, it will be found to enter the smallest space. The excess of moisture should be dried with a napkin or bibulous

Fig. 8.

Fig. 9.

paper and the work continued until the joint is filled. Where the interspaces are wide, a second filling and firing will be necessary on account of the contraction of the enamel. If the fusing of the enamel is not done in a furnace, it would be well to invest.

The "Case crown" is the same as the Ash & Sons' tubed tooth, with the exception that the tube is sufficiently large to admit of a second tube which was originally intended to be internally threaded and screw on to a How post set in the root. It is well adapted for a hollow post crown, through which the root may be subsequently treated. When constructed in the same manner described for the Ash, it makes a substantial crown, and one in which the hollow post may prove to be a valuable and convenient adjunct.

In fitting the Logan crown to the above-described cap, a slit is first cut in the platinum or gold face, through which the pin or post is forced—the porcelain being subsequently ground and fitted like the others. (See Fig. 10.) When luted with enamel to the cap, and the post soldered (from the upper side) it makes a crown of considerable value, though not as easily constructed nor as perfect in strength or beauty as the Ash.

I now wish to describe a method for making porcelain-front hollow bicuspid and molar crowns:

Take an impression of the peripheral surface of the root with silver suture wire, and make a wooden model as described by me in connection with a method of making all gold crowns—published

Fig. 10.

in the June, '85, Cosmos and republished in Richardson's Mechanical Dentistry.

The face of the root should be cut the same as described for the anterior teeth, and the curve reproduced on the wooden model. Cut strip of gold same width as for a Richmond hollow gold crown. By the aid of the model you will be able to outline a flap (a—Fig.

Fig. 11.

11), which, when partially cut, curved to fit the curve of the root, and turned in upon the model, its edges should extend to the proximate sides of ferrule when in place, to which it should be soldered. The flap should be cut so as to extend only so far upon the face of the root as to meet the backing of the porcelain face, to which it is

Fig. 12.

ultimately soldered. The portion cut out of the ferrule for the flap will leave about the right sized opening into which to fit the porcelain face. (See Fig. 12.)

It is not always necessary to make a wood model as above. After a ferrule has been fitted to a root, experience will enable one

to cut the flap the proper size; when it may be turned in upon the root itself and burnished to place—finally soldering the edges.

Now adjust the ferrule or cap to root and take a plaster impression, which, when filled, will be a correct model of adjoining teeth, with cap in position. A bite should also be taken so as to show antagonizing teeth. Select porcelain face, back as before, and fit in the laboratory, allowing the proximate edges of cap to fall along the edges of the backing as described for the anterior teeth. If sure of the alignment the face may now be soldered. In this process the porcelain only should be covered with a small

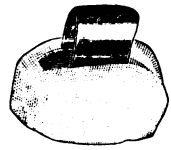


Fig. 13.

investment. The hollow loop, through which the heat from the blow-pipe may readily pass, will enable one to easily solder the edges of the backing to ferrule and flap. (See Fig. 13.)

Cut the cusp of porcelain face diagonally to receive the gold

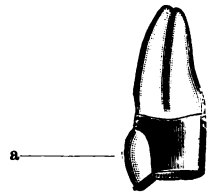


Fig. 14.

protecting and antagonizing cusps, (See a—Fig. 14), which may be swaged and filled or struck from a solid piece of pure gold. I prefer the latter—using a steel die-plate. The crown may now be

Fig. 15.

replaced upon the plaster antagonizing models and the cusps fitted properly, articulated and finally soldered. (Fig. 15).

It will be observed, I think, that the contour in no large spaces

is restored with masses of solder; that solder is used only to close mechanically-fitted joints; and further, the crown being two-thirds hollow, the post need not be soldered to it, but seated in the palatine root-canal and allowed to extend into the hollow space as in an all gold crown. Again that these bicuspid and molar crowns are similar in construction to the crowns described for anterior teeth; and finally the whole, because of their similitude may be adopted without difficulty as an adequate and complete system for constructing porcelain front crowns.

IMPRESSION OF ROOTS FOR CROWNING.

Dental Cosmos.

Dr. Palmer places a wooden peg in the root and packs gutta-percha around it, forcing the gum out of the way, and takes the impression with the pin in place, which comes away with the impression.

TO INSERT A PIVOT TOOTH WITH OXIDE OF ZINC.

DR. D. GENESE.

Ohio Journal Dental Science.

To have a thoroughly tight union to tooth substance and metal, prepare the canal thoroughly and antiseptically at first visit; on a point that will go to the apex, roll a cone of gold foil, carry it to the end condensing first with hand-pressure, following by the mallet.

When the pivot or crown is ready for insertion, syringe out canal with water as hot as patient can bear it; fold absorbent paper around the parts near to be operated on, and dry the canal.

Have ready a cone of cotton on an instrument with the phosphate of zinc saturated, also dampen the pivot or crown with the same; mix the oxyphosphate moderately thick, and commence by filling the root, it being previously moistened with the phosphate; all excess of moisture will be absorbed by the phosphoric acid. The mixed cement will be found to follow the course of the moistened surface, retarding for a few moments the setting, giving time for

the adjustment of the crown to its exact position. When accurately in place apply a heated metal surface, such as a large faced burnisher, to the tooth, taking the precaution of putting a layer or two of bibulous paper over the tooth to prevent sudden shock or cracking the porcelain by over-heating, and it will be found to harden the cement in a very short time without disturbing the crown from its position.

ABRADED MASTICATING SURFACE—TREATMENT.

DR. A. F. TOWNSEND.

Dental Cosmos.

Grind the tooth level upon the articulating surface, bevel the edge of the enamel, then drill two holes, one on each side, in the vicinity of the pulp to the depth of one-tenth of an inch. Then fit accurately a ferrule of pure gold to the beveled edge of the enamel. By beveling the inside edge of the ferrule make sure that it is a trifle longer than the tooth, and but a trifle, as the ferrule is used to form the surface of the cap, and if it is too large it will have to be ground away in finishing. The ferrule is made to restore the normal height of the tooth. Then take No. 4 cohesive foil and fold it to thirty-two thicknesses, and anneal it in the alcohol lamp; lay it over the end of the tooth, and press it up firmly with the finger while thrusting the pins which have been prepared through the foil into the holes made for them in the teeth. Then take a piece of beeswax about large enough to fill the ferrule, warm it slightly, and press it firmly into the ferrule. Then remove it from the tooth. The wax will hold all the pieces in proper position until invested. After the investment has hardened, wash the wax out with hot water and fill the ferrule with eighteen or twenty-carat gold solder. When it is removed from the investment, it should be tried upon the tooth and roughly finished with sorundum-stone and burnisher. It is then ready to cement into place and receive the final finish.

CROWNING WITH A PLAIN RUBBER TOOTH.

DR. WM. H. SHULZE.

Dental Cosmos.

Band the root as for an all gold crown, remove and cut away the front of the collar leaving a narrow band showing at the neck. Bevel the labial edge of the root so that the tooth can set well into the collar. Replace the collar on the root, dry out, and place a little softened wax onto the end of the root. Select a suitable plain rubber tooth, nip off the heads of the pins, grind so that it will enter the collar, adjust, and articulate, pressing the tooth against the wax. Carefully remove the collar and tooth. Invest in plaster and asbestos fiber. Fit a thin piece of platinum into the collar, burnishing it down onto the tooth, and bending it down to the pins. If it is desired to use a post, remove and punch the platinum plate at the proper place, and solder in a post; replace within the collar, and secure with a piece of binding-wire imbedded in the investment. A little 18k. solder will join together the collar, platinum-plate, and tooth-pins. If there are any places where the collar does not fit the tooth closely, pack in gold foil before soldering. If the inner cusp does not fill the collar, or it needs lengthening for occluding purposes, get the desired shape with wax when fitting the tooth. Remove the wax after investment, pack in gold foil pellets, and add enough 20k. solder to flow through it.

ORTHODONTIA.

CENTRALS OR LATERALS INSIDE THE LOWER ARCH.

DR. H. C. MERRIAM.

Archives of Dentistry.

Taking advantage of the fact that the under erupt first, and noticing the approach of the upper, I tie the under back to the six-year molar until the upper is erupted beyond danger, then remove the ligature and let nature take care of the rest. This has worked very well in simple cases.

PIANO WIRE SOLDERING.

DR. CLAPP.

Archives of Dentistry.

Two pieces can be firmly united by wrapping with a few turns of fine binding wire, over which soft solder is flowed with as little heat as possible. It is best to use muriate of zinc to make the solder flow easily. In this way you can make almost an innumerable variety of shapes. You can solder on any sort of a shape of copper, or any metal that rubber will vulcanize around.

ANCHOR POST.

DR. B. H. CATCHING.

Ohio Journal Dental Science.

Cut off a toilet pin near the head, bend the end at a right angle, drill a hole in the buccal surface of first or second molar, plant the post with cement. Allow the pin head to extend about one thirty-second of an inch. With this simple arrangement you have the best possible anchorage for regulating appliances. No soreness, no inconvenience.

REGULATING LIGATURES.

Archives of Dentistry.

Dr. H. C. Merriam uses China grass line, which shrinks anp remains tight without softening. It can be bought of dealers in fishing tackle or of Dame, Stoddard & Kendall, Boston.

TO RETAIN COLLARS ON TEETH AND ROOTS.

Dr. W. G. Lange, Dental Cosmos, says dry the tooth thoroughly and apply shellack varnish, then set the band with cement. In using the shellack for regulating appliances, he advises the addition of a little pumice or plaster.

MAKING AND RETAINING REMOVABLE APPLIANCES.

DR. V. H. JACKSON.

International Dental Jonrnal.

As bands of gold and gold and platinum are being used generally for attaching and retaining appliances to the teeth, and also for retaining teeth in position after regulating, a few remarks may be appropriate first, as to the best method of making and retaining them. The metal should be as thin as can be used, and still have sufficient rigidity so that when driven it will conform readily to the tooth. Gold meets the requirements better than gold and platinum in most cases, as the latter is not sufficiently yielding, and is more liable to discolor when used in contact with piano wire. Better results are obtained by forming the band on the natural tooth than on a model, and much depends on its adaptation.

If there is to be much strain on the band it should be rather broad, and burnished to the tooth with the ends lapping on the lingual side in most cases, at an angle best suited to make a good adaptation. For the incisors or cuspids, a broad piece of gold may have a V-shaped piece cut out of either end, and then burnished to the tooth with the ends drawn together on the lingual surface and soldered, thus adapting it perfectly to the tooth.

A very strong band can be made by fitting two narrow bands to the tooth, having them close together on the lingual and separated on the labial side, and make an impression with mouldine of the front of the tooth and bands, then remove the bands and place them in the impression and solder the parts to be united. The bands can be used in this way, or a thin piece of gold can be burnished to the labial side of the band and soldered.

To assist in retaining, the inside of the band should be roughened by raising ridges with a sharp instrument, and the tooth polished with a fine grade of pumice-stone so the cement will adhere more readily to it. The cement is used rather thin, and kept dry by rubber-dam or spunk.

Where there is a great downward pressure on the band, as when superior incisors and cuspids are being forced forward, it can be sustained in many cases by passing a small platinum wire around the neck of the tooth one or more times, then passing the ends either way below the band, and then twisting together before the cement hardens. If well adjusted, this will, in most cases, resist the most severe strain on the band.

There is also a method of putting a screw through the band and adjusting with zinc phosphate, at the same time tightening the screw.

If there is to be a projection from the band on the distal or mesial surface, for the purpose of retaining a tooth once rotated, or to hold an appliance from slipping from the lingual surface of the incisors, it can be most easily made by bending the ends at a right angle with the bands and then soldering. The projecting end can be ground or filed to any desired shape, or a lug, or tube, may be soldered to the band for similar purposes. Bands can be removed usually without cutting, by forcing a thin, straight burnisher between the band and tooth.

It frequently occurs, when regulating with rubber plates, that an extra spring is needed to complete the regulating. The writer has often attached a piece of piano wire for that purpose, by passing it through a hole in the plate a quarter or half an inch, with the end flattened and formed to fit the surface, and fastened by drawing a binding wire through holes in the plate either side of the flattened wire, and twisting the ends together.

Two or more pieces of piano wire are joined in any desired

position, and held temporarily with cord, then bound with fine binding wire of copper or iron, wound close together usually, and soldered with soft solder or tin, by holding the parts over a spirit lamp and applying small pieces of solder, the surface having been covered with muriate of zinc; the zinc solution should be very much diluted.

The method of attaching springs to a rubber plate is accomplished in a similar manner by soldering a piece of metal to the end of a piano wire, to be used as a spring for moving teeth, and for retaining the plate in position in the mouth, etc. (See Fig. 1.)

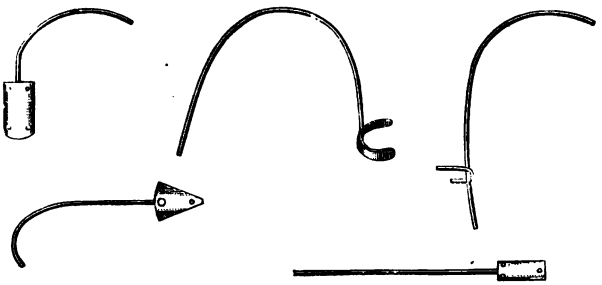


Fig. 1.—Reduced one-half.

The spring or piano wire is flattened on the end, without drawing the temper, and a thin piece of coin silver, German silver or tinned copper, about one-fourth by half an inch in size, is made in form something like the bowl of a spoon. The flattened end of the wire is then fastened into the depression of the metal by drawing binding wire through holes made with the plate punch, either side of the piano wire, and twisted as close as practicable, with the ends left long, and coiled up in the depression to assist the solder in flowing.

It is then heated over a spirit lamp and soldered by applying pieces of solder or tin, as before described, until the bowl part is filled, when the surface of the solder may be filed, or flattened by turning it down on an anvil and cover with a thick piece of lead and hammered until it is level; the latter will be found the quicker method.

The edge of the silver is trimmed to the desired form, and holes punched with the plate punch in the corners for the rivets.

Gold can be used in place of other metals, if soft solder is used, but, owing to the great affinity of tin and gold, tin is not practicable.

A piece of watch or clock-spring can be used to advantage in some cases in place of piano wire.

The common brass pin, with the temper drawn, is a convenient rivet to fasten springs to rubber plates.

The whole appliance can be immersed in molten tin, if it is desired, soldering and plating it an once, or the wire can be tinned before soldering.

In this manner bands or clasps of silver or most any metal can be attached to the end of spring wire to hold it in place on any tooth it is desired to move.

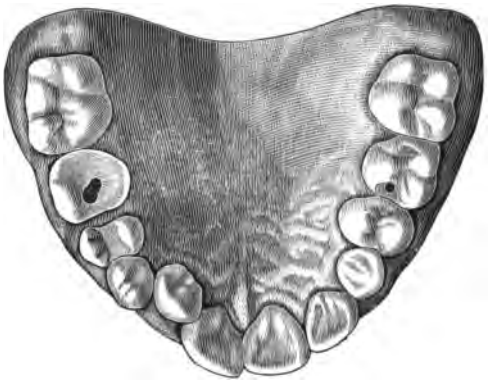


Fig. 2.

A method of keeping the end of the spring wire from pressing on the gum, or slipping off of the teeth when regulating molars or bicuspids, is accomplished by twisting a copper wire around the piano wire one or more times, and soldering with soft solder. Apply by allowing one end to project into the space between the teeth, and the other end to rest on the grinding surface.

For the same purpose a bow of copper wire may extend up over any prominence on the surface of a tooth with the ends united to the piano wire opposite the space between the teeth, as before, or a very thin piece of tinned copper may be burnished to the model of the tooth and soldered to the spring wire in the manner described for soldering metal to piano wire.

The practicability of spring wire being used independently of plates or fixed appliances I have demonstrated in many cases, as from my experience I have found but few irregularities of the teeth that cannot be corrected by the use of the band and spring, which, as a rule, is more easily made and adjusted than other appliances.

A simple method adopted to force a superior incisor into proper position that stood inside the normal line of the arch was to cement a band to the tooth, with a U shaped piece of metal attached to the lingual side. A piano wire of about No. 20 gauge was formed to follow the curve of the arch back of the incisors with the ends in form of a letter S, and allowed to project into anterior proximal cavities of the temporary molars. (See Figs. 2 and 3.)

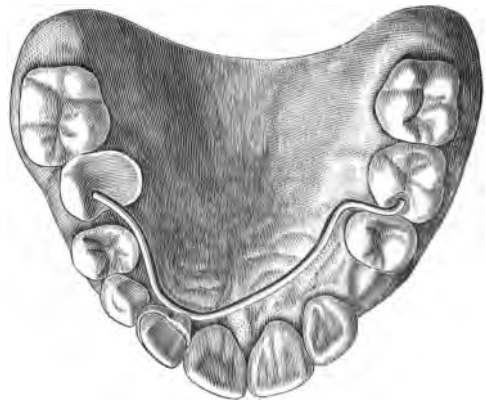


Fig. 3.

The pressure was increased by removing the wire and straightening the ends. The regulation of the tooth was accomplished in thirty-four days, with perfect comfort to the patient, a very desirable feature, especially in the case of children.

PLATE SCREWS FOR REGULATING.

Dr. J. R. Wiley, International Dental Journal, recommends jewelers' steel plate screws for drawing in or pushing out teeth.

BANDS FOR REGULATING.

Ohio Journal Dental Science.

With different sized punches, such as those used by workers in leather, cut rings from rubber-dam, using larger or smaller rings, and thick or thin rubber, according to the case for which they were required. They retain their elasticity well.

CORRECTING IRREGULARITIES BY THE SPRING OF GOLD BANDS.

DR. B. S. BYRNES.

International Dental Journal.

Patient fourteen years of age. I first used a fixture embracing the two bicuspids on either side with a continuous band around the front of the cuspidata and behind the incisors. (See Fig. 3.) The object was to crowd the incisors more together and force them

Fig. 3.—Natural width of arch.

forward. Work progressed well to a certain stage, when my patient complained of the soreness being altogether in the bicuspids. This necessitated another invention.

The following one was substituted, which is a simple long strip of gold with the two ends soldered together and woven around the

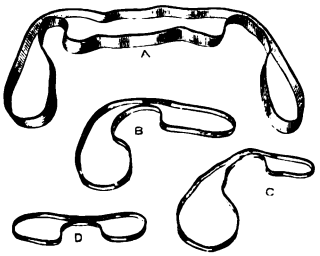


Fig. 4.

teeth. (See Fig. 4, A.) It was around the first bicuspids on either side, which doubled the strips in a parallel line on the anterior surface of the cuspids; the inner strip was passed behind the incisors and the outer strip was continued on their anterior surface. This simple fixture had a threefold object: To force the bicuspid out-

ward, to force the incisors forward, and to hold them in line at the same time.

Fixture 2 was discarded for two somewhat similar ones. (See Fig. 4, b and c.) The left central being very prominent, I concluded to leave it free; so placed a small loop around the left lateral, doubling over the cuspid and embracing the first bicuspid on the right side, enclosing lateral and central in the loop. While these two bands were on, it was necessary to weave a band in like manner over the left central, looped from left lateral to right central, which was to bring the incisors in line. (See Fig. 4, d.) Having brought the incisors in line and spread the superior arch by means of occlusion, inasmuch as the bite was very close, go back to first principles and make a retaining fixture, which is formed of a simple band embracing the first bicuspid on either side instead of both bicuspids, with a continuous strip passing in front of cuspids and behind incisors.

SIMPLIFIED ORTHODONTIA BY ZIGZAG SPRING AND SHIELD.

DR. FREDERICK SLEEP.

Dental Record.

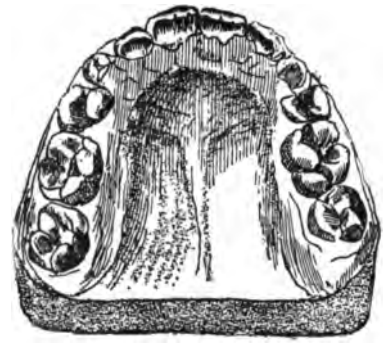
The case I illustrate in full came under my notice two years ago; the patient, a young lady, aged 14. It was undertaken somewhat languidly, for besides the aggravated deformity which precluded even my little finger touching the median line of the palate (see plate 1), the young lady was eminently neurasthenic.

I began routine practice with Dr. Coffin's plate, but seeing early the aforementioned defects, came to the conclusion that the case must be treated on other lines, or abandoned with less benefit than was desirable.

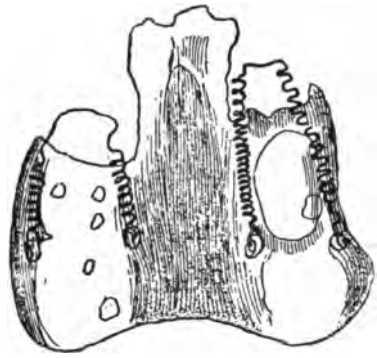
The superior maxilla, as the model indicates, protruded, making wide separation between the upper and lower incisors. So widely, indeed, that the lower lip was thrust habitually into the opening.

I determined therefore to extract the second bicuspids, to draw all the forward teeth back by the space gained, and to concentrate my energies on the fœtal angle.

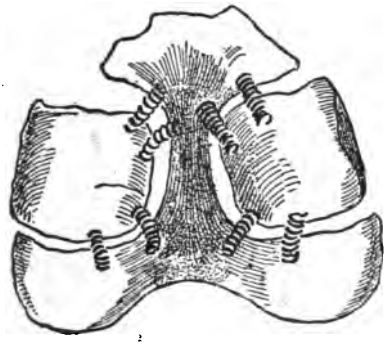
efore Treatment.



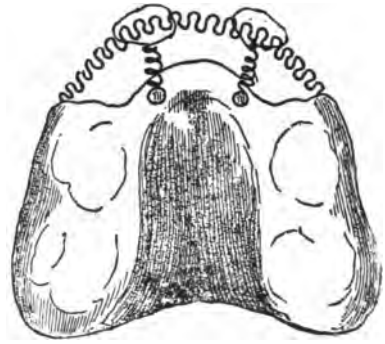
After Treatment.



N°1



N°2



N°3

The first bicuspids and canines were readily brought back in a manner, which, for simplicity, ease of adaption, economy of time and substance, easy removability and replacement, may not readily be surpassed.

The model having been lightly painted with a thick solution of rubber, a piece of rubber (I have found "horn" to lie steadier than most sorts) previously cut to lead pattern and previously softened on a hot-plate, is quickly adapted with wetted fingers from plate to teeth and over labial borders, pressing whilst still warm into every sinuosity.

The rubber overlapping all teeth in front of the first molars was now cut off with a hot knife, and the flattened ends of two compo swivel eyes were warmed and pushed into the rubber, one on lingual, other on labial side, and parallel to one another, the same being done to both right and left sides of the plate (plate 3) and carefully vulcanized (being held at 260° twenty minutes before rising).

A piece of compo spring having now been pulled and partly stretched, a small portion midway between the extremities was strained and rubbed straight out over the extremity of a fine beck iron. This straight part of wire was adapted to hitch or yoke over the front of the forward tooth, and the spring being bowed was bound at ends in the parallel eye-holes (a provision against breakage). As the teeth closed up it was tightened again by removing plate and merely pushing the opened spring closer together and then replaced by patient or self. In this way by acting on one side at a time for fear of moving back teeth forward, the bicuspids and canines were rapidly brought back.

The laterals and fronts were retracted in like manner by a single piece of opened spring looped over teeth and attached to the head of a swivel bolt. To economise space, for explanation the method is illustrated on plate 5. It will be found suited to draw back, push out, or even to turn a tooth on its axis, and to be easily inserted and removed by the patient. This last method, however, better suited for manipulating one tooth at a time, had better have been replaced by the zigzag method to be shortly described and to have been put in practice later on. The obnoxious angle now demanded attention. It was desirable to move the converging teeth and alveoli outward in their vertical positions, and to enlarge

the palatine circle at the same time. Its accomplishment was alike a surprise and delight from the ready respone of the parts to the simple device employed.

The palate being covered, and teeth capped with rubber in the manner before intimated, two pieces of spring previously stuffed with wool and planished down to point at ends, were inserted and built over at extremities with rubber manipulated with hot knife (plate 4), and shields were cut as figured down plate, between affected teeth and through the external labial border with a heated blade.

When vulcanized, the shields were cut clean through the mark with a spring saw, and were then free on expansion to work in any direction, directly outward, semi-circularly, from front, backward, or in any other direction not required in present case. By manipulation out of the mouth, the distance of shields to plate daily widened and result (plate 2) quickly brought about.

After leaving the case a week or two to secure implantation, the front teeth which had been left partly retracted and retained by T piece retainers for further treatment when greater expansion was secured, once more claimed notice; and, again, what was to me another novelty suggested itself.

Another plate being formed, a very fine gold wire was bent into convolutions about or more than two-thirds length of the crowns of the teeth, and the terminal points of this zigzag inserted in the labial flanges of the rubber at the median line of the external position of the bicuspids (plate 5.) This was tightened daily by being drawn together in or out of mouth with a fine pliers grooved near tips with a file. All the inclined planes quickly marched inward and to the perpendicular. Any tooth lagging or out of circle was quickly hurried by bending one of the toes of zigzag standing opposite the prominence, thus was any tooth turned or forced in any direction desired. When finished the young lady wore the same plate as a retainer.

A word on regulating materials. I must declare my preference for gold before all others. It may, by proper alloying, be made more tenacious than steel, be more frequently bent without breaking, is better appreciated by patient, is not affected by the sulphur liberated in vulcanization, and is of the same value when returned as before, minus trouble of remelting and drawing out.

The principle of regulating lower dentures being conveyed to any practical mind by the illustration appended, it is needless to show the lower plate, it being manufactured on the same lines, with the exception that it is necessary to imbed a thick tinned knitting needle around the lower lingual border of the vulcanite, which should be somewhat thickened to allow strength for expansion of the independent wings or shields, and likewise, I may add, a piece of spring may, if desirous of extra strength, be put at each side of labial border of shield on either upper or lower plate in same manner as on lingual side, and would allow same range of movement, the improvement being just as marked as the upper, and all that could be desired.

THE ANGLE SYSTEM.

DR. C. S. CASE.

Dental Cosmos.

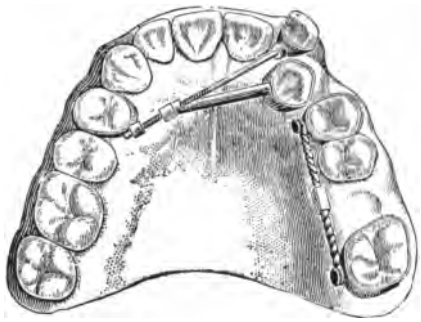
As I have seen no printed instruction of how all this material may be made by any dentist of ordinary mechanical ability, I think it will make a not uninteresting or uninstructive demonstration. I shall also attempt to show how the material, after being made, may be fitted into a great variety of regulating appliances, all of which will have general features that are similar within a comparatively small family of resorts, and differ from each other only as the force is made to differ by ingenious variations of the apparatus to meet particular requirements.

The models and drawings which I show, taken from cases in practice, are intended only to illustrate the application of this system; and while some of the contrivances will be found to differ materially from anything hitherto published, no claim for originality is intended, or anything more than will naturally arise in a successful application of the implements.

Under this head I call attention to Fig. 1,—better shown on the model,—in which the ordinary Angle jack-screw is cut so that the bar passes through the side of the tube and is made to pull the lateral incisor into the arch, while the counter-force pushes out the inlocked cuspid. The free end of this combination jack-and-traction-screw implement is held in place by the smoothed end of the

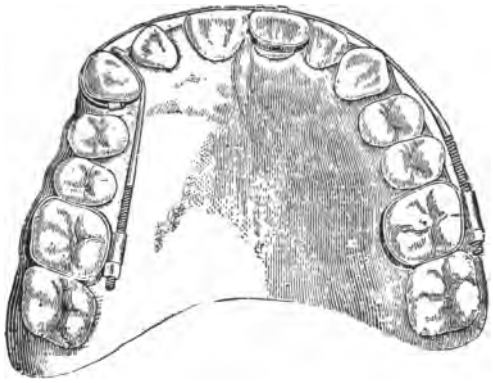
bar, loosely resting in a pipe attached to the band of an opposite bicuspid, through which it freely passes as the lateral comes into line.

FIG. 1



Here also is shown an effective traction force produced by twisting a soft silver wire. The wire is looped through holes in a squared button and around lugs soldered to the bands of the teeth

FIG. 2



to be moved. The ends may be soldered or twisted together, after which the button is gradually rotated.

In my own practice, the rotating springs suggested by Dr. Angle have not always proven successful. This has led to the adoption, in difficult cases, of a screw force, as shown in Fig. 2. Two small lugs or buttons are soldered to the band on opposite sides of the tooth to be rotated. These are made to engage with the ends of thin bands of wires, which, after passing partly round the tooth, ends in screws and anchorages.

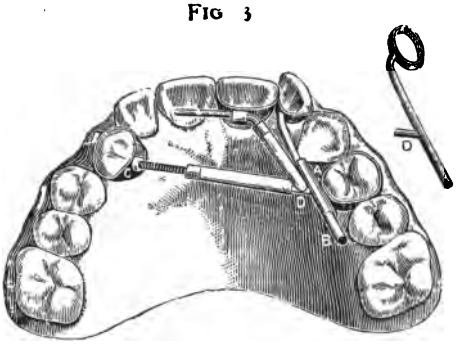
This scheme cannot fail to be effective, and what is also quite

important, as will be seen in this particular case, it enables one to locate the final position of the tooth.

Fig. 3 will serve to illustrate the development of an apparatus which must be studied in order to be fully appreciated.

Soldered to the band of the bicuspid is a section of a split tube (A), forming a trough in which glides a bar (B), one end of which is attached to the band of a malposed lateral incisor. A branch (D) is soldered to the bar upon which rests the end of a short jack, which will force the bar along the trough and draw in the lateral incisor, while the counter-force is exerted against the two centrals, which are tipped slightly in. The end of the branch (D) also

FIG 3



engages with another jack which forces out an inlocked cuspid (C) on the opposite side of the mouth. The arch is enlarged to make room for the lateral incisor by the combined force of the two jacks pushing outward the bicuspid and central incisors. The band of the cuspid is supplied with a short pipe on its labial surface, into which a pin will be thrust, locking it in place when in position, and the jack removed. The remainder of the apparatus will give little inconvenience by remaining in the mouth till permanency of position is established.

The material which Dr. Angle has finally adopted for this system is almost entirely of German silver, and while it is somewhat difficult to keep the appliances from turning black in the mouth, it possesses many favorable qualities which cannot be duplicated in any other metal.

The band material is made of German silver wire, Nos. 15 or 16, English standard gauge, rolled to a thickness of .004 or .005 of an inch. I would suggest that the rollers be so adjusted to give

a serpentine shape to the band when it is passed through the last time. This can then be cut into pieces that are more or less crowning, and in consequence more easily adapted to the conical shape of teeth.

Dr. Angle uses only two sizes of German silver wire, which he is particular to have drawn with perfect accuracy to four and five hundredths of an inch in diameter (about Nos. 19 and 18, respectively, E. S. G.); the larger, drawn very hard, for the jack-screws, and the smaller for all traction-screws. The threads are cut, respectively, in Nos. 7 and 4 holes of a Perrilet and Martin's screw-plate No. 36.

The nuts are made of five-cent nickels, which are found to be of proper quality and thickness to be easily cut, and withstand every desired force, while they suffer no oxidation in the mouth that retards them from readily gliding upon the screw. Saw the nickel in halves, and mark it into small squares a little larger than the required size of the nut. These are again cross-marked or punched in the center for a guide to the drill.

The drills (also the tap) I make of Stubb's steel No. 13, E. S. G., to fit hand-piece of dental engine. File down the drill end until it will pass tightly through the desired hole (Nos. 4 or 7) of the screw-plate; in other words, so that its diameter will be equal to the inside diameter of the nut you are about to make. The shank should be slightly constricted, and the twist-shape given with a very small rat-tail file. In tempering, bring the drill end to a cherry-red, plunge suddenly into water or mercury, and draw shank to a light blue. Cut off the length of engine-bit, and shape end to fit hand-piece or lathe-chuck.

TO MAKE TAPS.

To make taps, file the steel down to the respective sizes of the screw-bars or wires of even diameter, three-eighths inch from end,

FIG. 4.

and shank constricted same as drill. The thread is now cut in the No. 7 or No. 4 hole of the screw-plate, and the tap tempered as above; after which it is ground three-cornered, tapering slightly toward the end. At the other end of the tap I make a screw the length of the nut, with an abrupt shoulder, and square the shank

diagonally the required size of the nut (see Fig. 4). This, when tempered quite hard, will be found a valuable and almost indispensable adjunct to the finishing of these exceedingly small nuts. The instrument should be about five inches long, and handled with a pin-vice.

I have fully described the method of making the drills and taps, because it will be found quite difficult to obtain otherwise, instruments of this kind of the required size. And, further, if one will obtain the proper screw-plate and steel, a little practice will demonstrate the fact that they are not as difficult to make as may appear from the description.

The half "nickel" is now secured in the vice and each one of the little squares in the first row is drilled, tapped, sawed off along the marks, and finished as described.

TUBES AND PIPES.

The tubes and pipes for the jacks, traction-screws and rotating wires are made of German silver plate, Nos. 28 to 32, E. S. G., according to the size of the tube you are about to make. Cut into strips a little wider than the required diameter. The edges should be squared or made slightly diagonal, so that when drawn they will form a perfect joint. They may now be partially turned by striking them into a groove in the end of some hard wood or iron, using a piece of the No. 13 steel; after which one end should be tapered and the sides rolled solidly together for about three-fourths of an inch. This will enable you to start the piece through a large hole in a draw-plate (Joubent & Gerante best). Grasping the protruding end with a strong pair of pliers, you will now draw it through one hole and another until the edges of the tube come perfectly together. This operation may be continued until the tube is of the required size.

The tubes for the jacks are drawn quite hard, not requiring to be soldered. The others may be annealed frequently, care being used when soldering the sections to bands and bars to place the joint side next to the soldered surface.

The steel piano-wire used by Dr. Angle is not the large size commonly employed, Nos. 10 or 11 being found amply sufficient.

A SIMPLE REGULATING APPLIANCE.

DR. GILLETT.

Archives of Dentistry.

A very simple case in regulating, in which the upper central incisors, in coming down, caught between the lower ones in such a way as to stop their eruption. It was the case of a delicate little child, and it was desirable to make an especially simple appliance which could be worn without discomfort. The plan pursued for moving out the centrals was to cement to the first molars platinum caps, covering the grinding surfaces, and having soldered to their palatal aspects small tubes into which were slipped the ends of a piece of a gold spring wire, gauge 22. This wire conformed to the outline of the palatal aspect of the arch, being supported in front by two little clips attached to bands about the centrals. Each end was threaded and carried a small set-nut which, when turned, impinged upon the tubes into which the wires were passed on the molar caps, and so carried the whole wire forward. The springing of the wire under this kept a constant pressure upon the centrals, doing the work in a few days. The point which I wish to come at is a ready method of making the molar caps. This die is made of a fusible metal which may be run into a modeling compound, or even into a wax impression if care is taken to cool it quickly. This die was made in a modeling compound impression of the molar to be capped; it was then covered with heavy tin foil, burnished down, and was set into some more of the same metal poured into one of the little square boxes which the depots send our right angle burs in. In this way a die and counter sufficient for such use may be made in a few minutes. The tin foil prevents their sticking together.

REMOVABLE SPRING FOR MOVING TEETH.

DR. V. H. JACKSON.

Dental Cosmos.

It is my purpose in this brief paper to describe and demonstrate with models and apparatus some methods of applying removable springs without the use of a plate for regulating teeth; describing methods that I am using daily. Piano wire is at present the

best spring for the purpose, although spring gold, silver, and German silver are often applicable, especially if the temper is not drawn while soldering, and that can be avoided in some cases by keeping the spring portion cool, or by using soft solder, which is usually preferable.

The difficulty experienced in regulating the teeth of the lower arch often prompts the dentist to delay the operation from time to time, and more often to avoid even its consideration.

I have been using for a considerable length of time metal spring appliances that are also applicable for the correction of irregularities of the teeth in the lower arch, cases of which I shall first briefly describe:

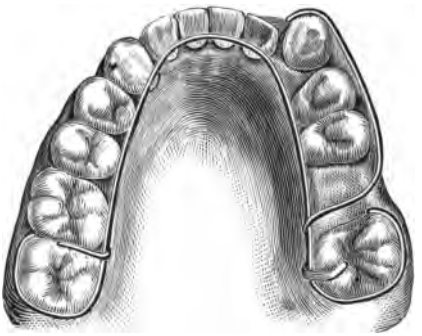


Fig. 1.

FIG. 1.—In the model here presented it will be seen that the right inferior cuspid was much too prominent, and articulated outside of the upper teeth, there being insufficient space for it in the arch.

The first molar was extracted, as it was defective, and a piano wire was formed to the lingual side of the teeth in the arch, following the line of the gum to the distal tooth on either side, around which the ends were formed to clasp. The gum was very prominent just back of the molars, and accordingly the plaster model on which the appliance was formed was then carved slightly to allow the spring to more perfectly clasp about the necks of the teeth.

A second spring wire was then formed to join the one described, and pass just in front of the second molar through the space made by the extraction of the first molar, and extend forward, terminating in a curve on the anterior surface of the prominent cuspid.

The two spring wires were then joined with soft solder, having

first wound the part forming the joint with small copper wire. The whole appliance can, if desired, be plated by immersion in melted tin.

The pressure of the spring was regulated by bending it toward or from the main wire, and by curving the end. The tension was such as to draw the cuspid and bicuspids backward, and move the cuspid into proper line within a month's time.

A variety of methods have been adopted to keep this form of appliance from pressing on the gum and slipping off from the teeth. Some of these have been published. The principal forms were wire points soldered to the main wire and reaching into the spaces between the teeth to keep the appliance from slipping off, and a similar wire extended on to the grinding surface, usually at the junction of two teeth, to keep the fixture from pressing on the gum.

Fig. 2.

This system has proven to be, for a certain class of cases, the most rapid in moving the teeth, and of the least inconvenience to the patient and operator of any yet used. The inner bar can be stiffened at any place desired by winding with binding wire, and flowing over it tin or soft solder, or an extra wire can be added in a similar manner at any stage of the operation.

A spring can extend from the main wire to either side of the arch to move teeth out into line, or to the labial side of the arch to force prominent teeth back to a proper position, or be adapted to rotate one or more incisors by pressing them against the main wire.

FIG. 2.—The arch can be easily expanded in many cases with a similar spring appliance. When used for that purpose, the principal or foundation spring can be arranged either on the inside or outside of the arch, as is found best suited to the individual case,

although it should in most cases have a small loop formed in the wire at the median line of the arch.

The same wire should extend back along the line of the necks of the teeth and clasp around the last one in the arch, and continue forward usually to the mesial side of the first bicuspid, and there extend over the grinding-surface and be soldered to the original wire, which will keep the appliance from pressing on the gum, and also clasp the teeth firmly. The opening of the median line loop from time to time will spread the bicuspid portion of the arch. The incisors can often at the same time be moved outward into line by the foundation-spring, by opening the loop and shaping the

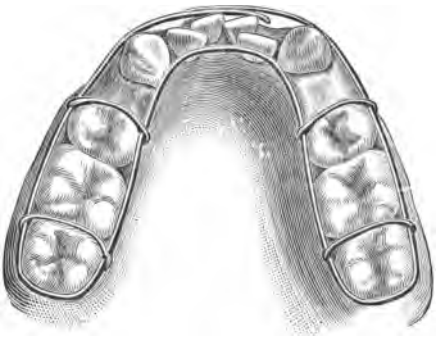


Fig. 3.

spring to press against them. For this purpose the spring should not be too stiff.

One or more additional loops of wire may pass over the grinding-surface at the junction of two teeth and be united to those on either side, if the appliance is not otherwise well retained.

This device for attaching apparatus to the teeth I have termed a "crib," a more minute description of which will be given farther on.

Fig. 3.—An effectual method of drawing too prominent or over-crowded lower teeth into proper line (as well as those of the upper arch) where a bicuspid has been removed on either side, leaving a space, is to arrange a spring wire on the lingual side of the teeth in the line they should assume when regulated. The wire should extend back, following the outline of the gum, and again forward on the labial side, forming a crib as described, except that the ends should be left free to form springs, which extend forward on the labial side of the teeth, beyond the median line, thus passing each other. By the inward pressure of the springs the teeth

are forced against the main wire and thus drawn into proper line. It is remarkable that the pinching pressure exerted on the teeth embraced between the inner and outer spring wires squeezes the teeth also to the right and left as if they were being directly pushed backward along the curved inclosure of the crib, which thus simultaneously compels and controls the movements of the teeth in the desired directions.

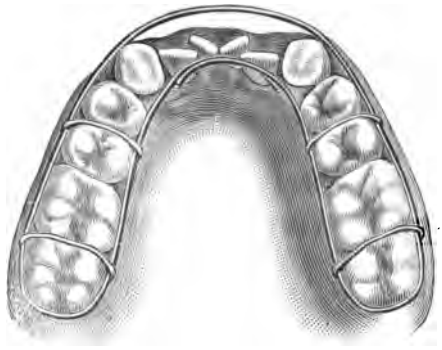


Fig. 4.

If the front teeth are not prominent enough, as seen in Fig. 4, the appliance should be made the same as the one last described, except that the main wire should be arranged on the labial side of the teeth and the springs on the lingual side, to press the teeth out into the circle made by the main wire in front of them.

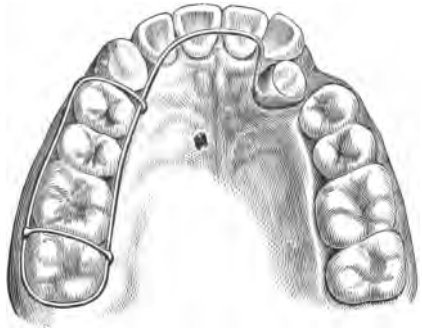


Fig. 5.

Fig. 5.—A "crib" for one side of the arch, with a spring wire passing across to the opposite side, provided with a partial clasp fitted to the tooth to be moved and soldered to the wire end, is efficient in some cases for pressing into line a cuspid or other tooth that is inside of the arch.

A similar crib can also be arranged on either side of the arch and the two be joined by a small spring wire, to which can be attached a T-piece to draw back prominent incisors, as in the V-shaped arch, and at the same time spread the anterior part of the arch by having the spring press against the lingual side of the teeth that are to be moved outward.

A case of a lady thirty-six years old, all of whose upper front teeth closed inside the lower ones: One lateral incisor and bicuspid and three molars were missing, some of them had been extracted years ago with the hope of correcting the irregularity; but the teeth had crowded together, and the articulation became so changed as to give an unpleasant expression to the features. Besides this, the labial surfaces of the superior incisors were becoming worn.

The difficulty that is often experienced of moving nearly all of the oral teeth in one direction was very marked in this case.

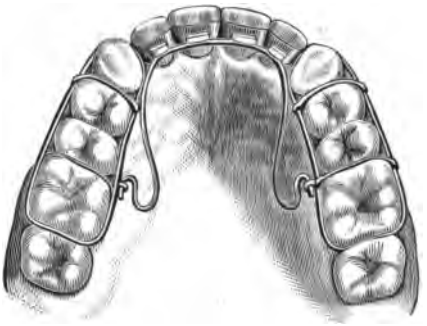


Fig. 6.

A crib was made for each side of the arch, to encircle all of the teeth back of the incisors; a slight separation was made by wedging in front of the cuspids, and a round iridio-platinum wire was flattened to pass into the space on either side, and extended back, following the line of the gum and surrounding the cuspids, bicuspids, and molars. This was supported and made to more firmly clasp the teeth by making cross bars to connect the two sides of the crib by passing over the articulating surface at the junction of the teeth, serving also to keep the crib from pressing on the gum.

There was a loop soldered to the crib-wire opposite the palatal surface of the first molar on each side of the arch, into which loop was hooked the end of a piano-wire formed like the letter S, and extended forward, passing just back of and following the curve of

the incisors. There were placed on the incisors gold collars with lugs soldered on their palatal surfaces to hold that portion of the spring in position.

FIG. 6 shows the device in place on the four incisors in another completed case of the same character.

Pressure was made as needed by straightening the S loops of the spring wire a little at a time.

The incisors were moved rapidly, and when sufficiently forward the portion of the crib in front of the cuspids was removed, and a piece of piano-wire was soldered to the original spring wire, which extended to the distal sides of the cuspids, by the application of which they were also moved forward. Another spring was then attached by solder to the original one, as before, to move the bicuspids forward, and at the same time one of the cuspids was prepared to be rotated by placing on it a collar, with a cylinder soldered to its palatal surface, to hold a spring which extended to the opposite side of the arch and hooked into the loop in the crib.

Fig. 7.

Fig. 8.

FIG. 7.—A cuspid or other tooth that is inside and a central or lateral outside of the line of the normal arch may at the same time be forced into line by constructing a crib for the back teeth on the same side of the arch as the teeth to be regulated, and from this crib extending forward the ends of the spring wire to the respective labial and lingual sides of the teeth which are to be moved.

FIG. 8 show an appliance on a model for rotating a tooth. It is made like a crib, with the main wire following the outline of the gum as before described, and the ends left free to act as a spring on the labial and lingual surface of the tooth to be rotated, on which is placed a collar having slight depressions or sockets to receive the

ends of the springs, which are curved to proper form to cause pressure in the desired direction, and conform to the surface of the gums. The appliance is easily made, can be used for any tooth, and does rapid work. The wide range of the action of these arms is peculiarly noticeable, for by them every conceivable direction may be given to the tooth, according as one or the other or both of the arms shall be adjustably bent for action.

In uniting piano-wires to form the crib, the joints are strengthened by first drawing the temper of the end of the wire, and flattening it very thin with a hammer, again drawing the temper and bending it around the main wire before soldering. If great strength is needed, very thin copper wire should be wound about the joint before soldering. It is always well to make the parts bright and tin them before uniting, if soft solder is to be used. Use at all times a very weak solution of muriate of zinc, and preferably employ the soldering iron. Collars are indispensible in many cases for holding the ends of the spring in position on the teeth.

For the ordinary case a lug may project from the collar, but for special rotating purposes a socket is made usually by soldering to the collar a loop of small platinum wire in suitable position to receive the end of the rotating spring.

If the crib is not well retained by the devices previously described, a separation should be made by wedging, to allow a cross-wire to pass between the teeth to connect the sides of the crib; or a spring can extend from the crib to clasp a tooth in the same manner as for retaining a plate, or collars with slight ridges on their surfaces can be used as previously described.

DENTAL MEDICINE.

ANTRUM OF HIGHMORE—SUPPURATION OF.

DR. MOREAU R. BROWN.

Dental Review.

The lining membrane of the antrum participates in the inflammatory process resulting from catching cold in a similar manner to that of the Eustachian tube. After the cold has passed, the inflammation and suppuration, should it have reached that stage of purulency, may disappear, and the membrane return to its former condition, minus a certain amount of its normal ability to withstand such disturbances. Repeated attacks of this nature soon lead to the chronic form of the disorder.

Symptoms.—Should the inflammation be acute, there will be pain and tenderness with a sense of weight and fullness over the antrum and with pressure up against the eye, hyperæmia of the ocular conjunctiva, and sensitiveness of the teeth, especially noticed on masticating. The pain is increased by stooping over, and is worse in the morning.

If the inflammation owes its origin to dental complications, the symptoms indicative of these disorders are added to the above; or, if it be the nasal mucous membrane that is affected, those of the coryza are also present. Should the natural outlet of the sinus become closed, as it frequently does from swelling of its lining membrane, the pain increases and the face is more tender.

The formation of pus, which is announced by a chill, causes distension of the walls, which may produce disturbance of vision by pressing on the orbital plate, and a tumor-like projection forms over the thinnest walls. Unless surgically relieved, spontaneous evacuation takes place. If the natural opening of the antrum into the nose remains free, the pus finds a ready outlet through this channel, and the irritation caused thereby to the delicate mucous membrane may produce an obstinate turgescence of the turbinated bodies and occlusion of the nasal passage. The purulent discharge will either gradually diminish and finally, in the course of a few days,

cease altogether, as is witnessed sometimes in coryza, or it may continue in diminished quantity, and all symptoms of a painful nature disappear. The latter is more apt to occur in cases from dental complications. The discharge now takes place into the nose at intervals during the day, particularly shortly after arising from bed in the morning, or on stooping over; also when lying down if the position of the head be changed, as on turning from the affected to the sound side. In this (now chronic) form of the disease, although turgescence of the turbinated bodies seldom occurs from the irritation produced by the pus, yet it has been observed to exist in a very persistent form. And that hypertrophy may thus be brought on, or an existing hypertrophy aggravated, I can bear personal witness to. I therefore believe that the hypertrophy of the middle turbinated body, and possibly the polypoid growths so often seen in connection with chronic empyema, are rather a result than a cause.

When the dental arch has been the cause of the purulency, the pus is of a very offensive odor, the opposite of what prevailed in several of the acute cases reported in my table from catching cold. Extension of the disease into the neighboring cavities, and even death, has been noted among the rarer events.

Diagnosis.—In acute suppuration we are so aided in the diagnosis by the history of the case, that with ordinary care the disorder can readily be recognized. In chronic empyema, a discharge which is influenced by position is observed by the patient to come from the nose. By carefully inspecting the nasal cavity we shall often find pus; it may be but a thin film on the anterior and inferior part of the middle turbinated body, or between it and the outer and inner wall. When wiped away, fresh pus can occasionally be made to appear by changing the position of the head or pressing upon the thin walls of the antrum.

Voltolini's method, as described and brought to greater perfection by Heryng, is of undoubted value. It is employed as follows: The patient is placed in a room made absolutely dark and a small Edison incandescent lamp of about four-candle power, which has been connected with a battery and fastened on the upper surface of a tongue depressor, is put in the mouth. The lips are now closed and the current of electricity turned on, so that the lamp may glow to its full intensity, whereupon the bones of the

face will become beautifully illuminated, a darker shade marking the situation of the antrum. Should there be fluid or a tumor within the cavity, the fact will become apparent by total absence of the illumination, and the marked contrast with the healthy side.

The water rheostat made by McIntosh & Co., of this city, or a thirty-two-candle incandescent lamp, used in the circuit with the Edison current, has enabled me to carry on my experiments satisfactorily.

A more simple test, and one upon which full reliance can be placed, is made with the peroxide of hydrogen used as follows: Cocaine having been freely applied to the middle turbinated body and the mucous membrane of the nasal cavity until thoroughly anæsthetized and contracted, a small hypodermic syringe, with a long cannula bent within a quarter of an inch of the distal end to a right angle, is passed into the hiatus semilunaris and a solution of peroxide of hydrogen (one part to twelve parts of water) is injected into the antrum. If pus be present, it is driven out and fills the nose as a white foam. That the solution has entered the antrum will be made evident by the patient complaining of slight pain at the roots of the teeth and a sense of fullness in the cheek. I know of no test so simple, free from danger and easy of application, and yet so unfailing as this. By its means I have been enabled to diagnose empyema of the antrum where the only symptom was a slight discharge of pus in the nasal passage. In one instance where the antrum was pronounced healthy by a consulting surgeon, a subsequent operation confirmed the opinion of suppuration I had been induced to hold after the application of this test.

By the proper use of the peroxide of hydrogen one can satisfactorily differentiate between purulency of the maxillary sinus and the other hidden sources of pus which is discharged into the nose. Should the ostium maxillare be occluded and we be unable to inject the antrum, the symptoms of distension would soon set in and give undoubted evidence of that condition.

If it be deemed necessary to make an exploratory puncture, the difficulties which may arise from the plugging of the cannula, the thick bone, the abnormal conditions of the inferior turbinated body, the different positions of the antrum and the danger of breaking the instrument, will cause one to hesitate before attempting it in the inferior meatus through the nasal wall, and to give prefer-

ence to perforating the facial wall above the alveolus with a small drill.

The prime object of opening the antrum is to give it free drainage, and to enable us to medicate its diseased mucous membrane. The latter of these indications is easy to accomplish, and the former only requires that the aperture be made in the most dependent portion of the sinus; but does drilling through the alveolus from below upward always secure this? Anatomists agree that there are several conical processes projecting into the antrum corresponding to the first and second molar teeth, one of which is generally sacrificed in the operation. When the tooth is removed the projection remains in the floor of the antrum, and if we penetrate the thin plate forming it and enlarge the opening, as is advised by writers on the subject, the base of the elevation remains and offers an obstruction equal to its height to the complete and thorough drainage of the antrum. This objection may be considered chimerical, yet we are justified in assuming it to be one which may exist if we hold the statements and drawings of anatomists correct, and as yet we have no reason to doubt them.

This may possibly have been the cause of failure to check the formation of pus in some cases reported in medical literature.

In the treatment the operation which I prefer is that of opening the antrum in its most dependent portion, but through the upper part of, or immediately above the alveolus, as follows: The mucous membrane having been locally anæsthetized, an incision is made into it or a small piece is cut out with a tubular knife just below the gingivo-labial fold between the upper portions of the roots of the second biscupid and first molar teeth. A drill, preferably driven by an electric motor, is entered at the point of incision into the soft tissues and directed upward, inward, and slightly backward, forming an angle of about forty-five degrees with the plane of the alveolus. A few revolutions will send the drill into the antrum at its most dependent portion. The opening thus made must be of sufficient diameter to admit of thorough cleansing and draining. A gold tube is to be well fitted so that the distal end will enter just within the antrum, and to the other end projecting beyond the mucous membrane a small strip of gold is attached and fastened to a collar around the tooth. By this method we have free drainage without the danger of foreign substances entering the

antrum, and plugging the tube is not necessary. I find that cases so treated have invariably done better than those where the opening had been made through the alveolus from below, and as the operation is free from any of the objections made to the latter, I urge its trial and condemn the extraction of a sound or even of a diseased tooth for the purpose of entering the antrum.

The after-treatment consists in daily or twice a day washing the cavity with a saturated solution of boric acid and occasionally injecting iodine, sulphate of zinc, or sub-nitrate of bismuth.

A summary of the nineteen cases which have come under my observatian during the past eighteen months shows, of twenty-one suppurating antra, that nine were due to "catching cold," eight were due to dental complications, one was due to polypi of the antrum; two cause doubtful, and one, unknown cause. Fifteen were diagnosticated by the assistance of peroxide of hydrogen. Three were cured, and one is now under treatment by medication through the natural nasal opening. In ten the antra were opened through the upper part of the alveolus below the gingivo-labial fold. In two a tooth was first extracted, and in four a tooth had been extracted at a prior date and the opening made through the alveolus from below. One patient refused treatment; one is now under treatment.

REMEDIES AND THEIR APPLICATION.

DR. W. H. ATKINSON.

Archives of Dentistry.

CAUSTIC POTASH.

Carbolic acid one-third, and potassfusa two-thirds; it is escharotic, anæsthetic, disinfectant and obtundent. It produces an efficient limited slough; useful in suppurating surfaces to kill the deteriorated surface and make inert the ferments that may be present, adventitiously or on purpose. From what we know of the character of carbolic acid alone, and of the caustic potash, when used without other combinations, we would be led to a very adequate conclusion; for, severely escharotic as they are when used alone, when combined as indicated, they seem to have produced a new body with especially beneficent qualities of action. In very

low sloughing ulcers and necrotic points in the soft tissues they have such an affinity as to convert the already deteriorated structure into a mass of debris, slough or scab, which limits the further penetration into tissue that is in nearly normal activity. The pain is very much modified in the combination from what it would be in using the elements separately. The immediately surrounding territory in a healthy condition should be protected by some neutral dressing, such as Husband's isinglass plaster, smoothly spread over the surface of the normal structure to prevent the spreading of any unexpended escharotic power resident in the eschar, which we must wait a few days to be rejected by solution of the line immediately between the living and the dead territory. The eschar represents the core of a common phlegmon or boil. A paste of tannin and glycerine should be spread over all the exposed and deteriorated surface, which should then be dressed with a light bandage upon the outside, in all cases that are external to the cavities of the body; but within the mouth, where it is liable to be moistened by the mucoid and salivary secretions, it will be well to saturate eight or ten-ply of bibulous paper with the tannin and glycerine and lay them gently and smoothly over the diseased territory. The locality should be washed every hour with a saturated solution of hydronaphthol in distilled water, for cleansing purposes and the destruction of any microbes that might find lodgment to set up retrogressive activities in the nutrition of the adjoining territory. This wash should be continued until the slough takes place, and when the eschar has been entirely removed, we will be able to determine whether there are wholesome granulations springing up in the cavity of lost tissue. If the morbid growth has not been entirely extirpated, we must repeat the application of the caustic paste at that place, and repeat the after-treatment, as already delineated. When all the morbid growth has been removed and we have succeeded in establishing a territory of new growth, granulation tissue healthily springing up, disinfectant treatment, by hydronapthol washes and a solution of bichloride of mercury, one grain to the pint of distilled water, faithfully carried out, will result in a cure.

AROMATIC SULPHURIC ACID

is another agent that is very efficient and benign in its activity upon morbid growths and ulcerating surfaces, especially those pockets where the connective tissue has been dissolved away and left

deep chasms along the line of teeth, between the cementum and alveolar walls. After drying out these chambers with bibulous paper, as thoroughly as may be, drops of aromatic sulphuric acid, full strength as it comes from the pharmacy, should be dropped into the open mouth of the pocket until it stands full, on a level with the surface of the gum and teeth. Wait until the affinities have absorbed and taken up the remedy, so that you cannot see that there is any fluid in the pocket, then fill it again, and again, and again, until the remedy ceases to be taken up by the diseased territory; after which the mouth should be washed with a saturated solution of bicarbonate of soda in distilled water and dried thoroughly with bibulous paper and then a paste of tannin and glycerine, spread upon several folds of bibulous paper, should be smoothly laid over the surface, and the patient dismissed; giving him a bottle of the hydronapthol solution to use as a wash frequently during the day, as often as every two or three hours, at his convenience. On the next day there will be little, if any, discharge from the pocket. Dry it well and then wash it out with peroxide of hydrogen, Chas. Marchand's, fifteen-volume medicinal, until it ceases to bubble; then dry out the froth with bibulous paper and repeat the aromatic sulphuric acid, by dropping it in until the chamber is full; subsequently going over the same process that was advised for the previous treatment, repeating it every day or every other day, until there is no longer any evidence of pus when the peroxide of hydrogen is injected into the pocket. The hydronapthol solution should be used frequently, and the bichloride of mercury solution three or four times a day, until the case is healed.

WINE OF OPIUM.

In all cases of aching of gums or teeth that have resisted medicament, I find great satisfaction in the use of wine of opium, full strength, injected into the pockets, where there are pockets and into the cavities, where there are cavities, and then saturrating packs of bibulous paper, smoothly laid over the territory where the pain is, until the narcotic shall be absorbed sufficiently to give the patient ease for the time, which usually secures them a good night's rest. As an obtundent and a modifier of nervousness and uneasiness, this remedy, when locally applied, is a very desirable and efficient agent. I do not regard it as curative

of suppurative surfaces, but as an adjuvant and quieter of pain, it affords us opportunity of applying the more vigorous remedies that we have just been considering, in cases of inflammatory action in and about the mouth. Patients should be instructed not to swallow too much of the wine of opium, lest they should be narcotized beyond the desirable point; but any patient will bear from thirty to sixty drops taken into the stomach without inconvenience, and generally with benefit, especially where phlegmonous abscesses are in progress, suppuration in the mouth or other parts of the economy. Whether it has any special ripening effect upon an abscess other than obtunding the nervous irritability, I am unable to say; but a few hours will often suffice for the pointing of a very uncomfortable alveolar abscess (gum-boil) so as to admit of opening and discharging the contents of the cavity within twelve to twenty-four hours, thus making tolerable an otherwise intolerable term of ripening of the abscess in the mouth of a nervous patient.

COLLODION

is a saturated solution of gun-cotton in sulphuric ether. There are two forms that the pharmacien provides for us—the one contractile, the other non-contractile. The contractile is that one composed of gun-cotton and sulphuric ether with a little alcohol, and the other is made of collodion, Canada turpentine and castor-oil. They are very useful protections to irritable surfaces, such as are present in phlegmonous abscesses and sloughing ulcers. Where the inflammation runs high and the tenderness is great, we prefer to paint, with a camel's hair pencil, the entire surface with the flexible, or second form of collodion. Where the inflammation is on the decline and we desire compression, we use the contractile, or first form of collodion, applied in successive layers with a camel's hair pencil, until a sufficient amount of contraction has driven the blood out of the capillaries and whitened the surrounding parts sufficiently to satisfy us that the blood supply will now be controlled and the patient have a comfortable time until the next visit.

CREOSOTE AND OIL OF CLOVES,

equal quantities by bulk, is a polychrest remedy that I keep always in the case, for application to aching teeth, painful gums, ulcerous surfaces, and also where pulps are not exposed. When a

cavity is prepared for filling, I wipe out to saturation the cavity with this agent; being careful not to make it too dry before filling; leaving it as a disinfectant and coagulant in the bottom of the cavity, before the provisionary or permanent filling is inserted.

CARBOLIC ACID

at one time was used as a disinfectant and escharotic remedy, as a microbicide and a sheet-anchor to windward to ward off inflammatory action. I now use it principally as a component part of caustic paste. The whole phenol series has such a similarity of action that there cannot be very decided preference given to any of the various compounds derivable from coal tar, without close attention upon their action and large experience of observation in many cases. Creosote and carbolic acid are so nearly alike as to make it no great sin to substitute one for the other, when they come from coal tar; but creosote obtained from the destructive distillation of beech wood, seems to have found favor among dentists and surgeons beyond the phenol or coal tar product.

VINEGAR

is another polychrest that I always keep in my medicine case; not so much for its direct action as vinegar, as for it being a dilute acetic acid, and a solvent of carbolic acid and creosote, whereever they have been used in excess of our desire for their action upon the tissues. Wherever we dress fistulous openings with tents upon which we have used caustic paste, carbolic acid, or creosote and oil of cloves, after pushing the tent into the depth of the cavity and excising it at the mouth, we swab out the excess about the mouth of the fistule with a strong vinegar, so as to prevent sloughing of the territory beyond that immediately confined to the fistule that we desire to enlarge for further exploration.

SULPHATE OF CINCHONIDIA

is a sheet-anchor that I have used for years as a tonic, taking the place almost entirely of sulphate of quinine; for reasons that may be chimerical in my mind, but nevertheless have a persistent hold upon me. I use McKesson & Robbins' granules, or gelatine capsules, two grains each; one in the morning and one in the evening; in all cases of depleted, nervous, irritable persons, such as bookkeepers, close students, teachers, and others who are confined in doors and deprived of a sufficient amount of air and sunlight and

out-door exercise; accompanied with the tonic effect of the sulphate of cinchonidia, four grains in the day, two in the morning and two in the evening. I say in connection with this, use nux vomica; phosphorus and cantharides as prepared by McKesson & Robbins; one pill each night, or each alternate night, until the desired tonicity of the system is attained. I am aware that this is not regarded as the special function of the dentist; but, as I have already intimated, the dentist, to be replete in his endowment, must know all that the medical man knows, beside what pertains to his immediate specialty in manipulation and the application of remedies; so that he is not only a dentist, but he is a doctor and plus; or he does not fill the measure of a modern acceptable member of the dental fraternity.

TINCTURE OF CALENDULÆ,

the tincture of the flowers of garden marigold, as a remedy that has found its way into general practice by the use made of it by the Hahnemanians, and is principally adapted to application, in full or dilute strength, to fresh, clean-cut wounds; in opposition to arnica, the Samson in bruised wounds and contusions. Wherever we make skin cuts so as not to have the lips of the wound at all injured or bruised, the tincture of calendulæ one part and water one or two parts, is an admirable dressing to induce union by first intention.

TINCTURE OF ACONITE ROOT,

Fleming's tincture, is a remedy much used, and is another polychrest always at hand. It is a controller of pain of a neuralgic variety, and is capable of arresting the pain of phlegmonous abscesses, gum-boils and obstructions of the sensory nerves in general, and often succeeds after many other nerve remedies have been used without success. One should be a little careful in administering it, not to allow the patient to swallow it, or have it flow over onto the soft palate and fauces, because of the unpleasant stridulous and choking sensation which often follows its presence in the fauces. Dentists principally use it as a local remedy, but as an internal controller of pain and irritability of the heart, it is not to be despised.

NITRO-MURIATIC ACID

is useful to the dentist in its full strength as aqua-regia, as an obtundent of sensitive dentine at the necks of the teeth and as a controller of pain and as a solvent of apthous ulcerous patches in the

mouth and mucous membrane, and as a corrective of the gastric juice in anæmic and dyspeptic patients it scarcely has an equal when administered from a phial in full strength, dropping from five to ten drops into a wine glass of sweetened water, just enough to make a nice kind of lemonade. It will control pain in the stomach and indigestion when followed persistently for from five to ten days, or until the digestion has so responded as to make one forget they needed a remedy. I merely mention this as a fact worthy of attention and adoption.

TINCTURE OF CHLORIDE OF IRON

is useful to the dentist as a hemostatic and as an escharotic, applied to ulcerous patches, and never disappoints me nor disturbs my conscience when I use it, even though it does come in contact with the enamel of the teeth. Some of our brethren have been fearful of the ravages supposed to follow its contact with the teeth when administered by medical men as a tonic.

SULPHITE OF SODA

is a very pleasant, convenient and innocent remedy, which should always be at hand to correct unpleasant odors in the mouth and throat, using it as a gargle; and when the stomach is out of order, a little of it may be swallowed with benefit.

SALICYLATE OF SODA

is one of the remedies that will assist us very much when we have neuralgic and rheumatic patients, especially those whose neuralgia depends upon a rheumatic diathesis. For inflammatory rheumatism it probably has no equal when given sufficiently to produce excessive diaphoresis and absence of pain and sleep. It may be well to state that there are some patients whose hearts are very much disturbed by heavy doses of salicylate of soda, and those who administer it should make observations, so as to either reduce the quantity or omit altogether its administration to such subjects.

GLACIAL PHOSPHORIC ACID

is an agent that enters into our oxyphate fillings and has considerable action upon the dental tissues, one of which is at first an unpleasant twinge, after which the cavity is so obtunded as to permit excavation with little suffering. From five to ten grains in a glass of sweetened water is a grand tonic to a tired operator when he is

nervous and irritable, repeated every thirty minutes until he is supported, and may be well worthy of our attention.

CHLORIDE OF ZINC

is one of the very best germicides that we have, and is an antiseptic. It is the fluid in which the oxide of zinc is mixed for temporary fillings, or bone fillings, so-called. Its special use is as a root filling, the object being to secure aseptic conditions of the cavity, enabling us to fill the balance of the cavity with whatever we please, and prolong the usefulness of the tooth.

HYDROCHLORATE OF COCAINE

is a remedy of considerable power at times, but the uncertainty of its action upon various constitutions renders it less liable than other anæsthetic agents. I have never seen alarming symptoms from its administration other than excessive exaltation of mind and bodily action to such a degree as to warn me not to administer it in large doses to such patients. For opening abscesses and extracting painful roots of teeth it has served a good purpose. I know of little difference in the action of a two per cent., five per cent. or ten per cent. solution of the remedy, which cautions me that we do not yet know enough about it to place unbounded confidence in its use.

ADMINISTERING ETHER.

DR. D. E. KEEFE.

International Dental Journal.

The great trouble in administering ether is at the beginning to give sufficient air with the ether so as not to strangle the patient, and then as soon as the patient gets accustomed to the ether to give only the ether vapor. To overcome these objections, use a large towel, folding it first four times lengthwise and placing a piece of paper the full length between the outside folds, then roll it up into a cylinder, the size to be governed by the face of the patient; you want it large enough to cover the face, and not too large. Now we have a cylinder open at both ends, full size. Then saturate the lower part of the cylinder, that comes against the face, with the ether, apply it to the face, and as the other end is wide open, the

patient gets a great deal of the air and also a great deal of ether vapor. A few breaths are sufficient for the patient to become accustomed to the ether. Then close the outer end of the cylinder, by bringing the sides together and holding them with the hand. The patient now only gets the ether vapor, and is very soon wholly etherized, and without any struggling or coughing.

FOR PAIN AFTER EXTRACTION.

DR. T. B. WELCH.

℞ Alcohol (best) ..... ℥ j
Chloroform ..... ℥ ij
Sulphuric ether ..... ℥ ¾
Gum camphor ..... ℥ ss
Laudanum ..... ℥ j
Oil of cloves ..... ℥ ss
Apply in the socket on a pledget of cotton

VAN VALZAH'S OBTUNDER.

Ohio Journal Dental Science.

Pip menthol ..... 2 ounces
Tincture of myrrh ..... 6 ounces
Alcohol ..... 10 ounces
The Doctor uses this as a local anæsthetic.

APHTHOUS STOMATITIS.

L'Union Medicale.

℞—Salicylate of soda, 20 parts:
Distilled water, 100 "
Dissolve.

In cases of aphthous stomatitis the inflamed parts should be painted with the above solution five or six times during the day, particularly after meals. The mouth should previously be well rinsed out with tepid water.

MUCOUS PATCHES.

College and Clinical Record.

In the treatment of mucous patches in the mouth in secondary syphilis Professor Gross advised, first :—Dry with absorbent cotton and apply a four per cent. solution of cocaine ; then apply the following with camel's-hair pencil:

℞—Hydrargyri nitratis (acid.), part i ;
Aquæ destillat., part xii. M.
Sig.—Apply once daily.

Between applications use the following:

℞—Acid. pyroligneosi, f℥ i ;
Acquæ destillat., f℥ viii. M.
Sig.—Use as a mouth-wash.

TUBERCULOUS ULCERS OF THE TONGUE.

Revue de Therapeutique.

℞—Lactic acid, 80 parts;
Water, 20 " M.

The affected parts to be touched several times daily wlth a camel's-hair brush previously immersed in this solution.

PRACTICAL CONCLUSIONS OF THE SECOND HYDERABAD CHLOROFORM COMMISSION.

The following are the practical conclusions which the Commission think may fairly be deducted from the experiments recorded in this report :

I. The recumbent position on the back and absolute freedom of respiration are essential.

II. If during an operation a recumbent position on the back cannot, from any cause, be maintained during chloroform administration, the utmost attention to the respiration is necessary to prevent asphyxia or an overdose. If there is any doubt whatever about the state of respiration, the patient should be at once restored to the recumbent position on the back.

III. To insure absolute freedom of respiration, tight clothing of every kind, either on the neck, chest or abdomen, is to be strictly avoided; and no assistants or bystanders should be allowed to exert pressure on any part of the patient's thorax or abdomen, even though the patient be struggling violently. If struggling does occur, it is always possible to hold the patient down by the shoulders, pelvis, or legs, without doing anything which can by any possibility interfere with the free movements of respiration.

IV. An apparatus is not essential, and ought not to be used, as, being made to fit the face, it must tend to produce a certain amount of asphyxia. Moreover, it is apt to take up part of the attention which is required elsewhere. However it is made, it introduces an element of danger into the administration. A convenient form of inhaler is an open cone or cap with a little absorbent cotton inside at the apex.

V. At the commencement of inhalation care should be taken, by not holding the cap very close over the mouth and nose, to avoid exciting, struggling or holding the breath. If struggling or holding the breath does occur, great care is necessary to avoid an over-dose during the deep inspirations which follow. When quiet breathing ensues, as the patient begins to go over, there is no reason why the inhaler should not be applied close to the face; and all that is then necessary is to watch the cornea and see that the respiration is not interfered with.

VI. In children, crying ensures free admission of chloroform into the lungs; but as struggling and holding the breath can hardly be avoided, and one or two whiffs of chloroform may be sufficient to produce complete insensibility, they should always be allowed to inhale a little fresh air during the first deep inspiration which follow. In struggling persons, but especially in children, it is essential to remove the inhaler after the first or second deep inspiration, as enough chloroform may have been inhaled to produce deep anesthesia, and this may only appear, or may deepen, after the chloroform is stopped. Struggling is best avoided in adults by making them blow out hard after each inspiration during the inhalation.

VII. The patient is, as a rule, anesthetised and ready for the operation to be commenced when unconscious winking is no longer produced by touching the surface of the eye with the tip of the

finger. The anesthesia should never under any circumstances be pushed till the respiration stops; but when once the cornea is insensitive, the patient should be kept gently under by occasional inhalations, and not be allowed to come out and renew the stage of struggling and resistance.

VIII. As a rule, no operation should be commenced till the patient is fully under the influence of the anesthetic, so as to avoid all chances of death from surgical shock or fright.

IX. The administrator should be guided as to the effect entirely by the respiration. His only object, while producing anesthesia, is to see that the respiration is not interfered with.

X. If possible the patient's chest and abdomen should be exposed during chloroform inhalation, so that the respiratory movements can be seen by the administrator. If anything interferes with the respiration in any way, however slightly, even if this occurs at the very commencement of the administration, if breath is held, or if there is stertor, the inhalation should be stopped till the breathing is natural again. This may sometimes create delay and inconvenience with inexperienced administrators, but experience will make any administrator so familiar with the respiratory functions under chloroform, that he will in a short time know almost by intuition whether anything is going wrong, and be able to put it right, without delay, before any danger arises.

XI. If the breathing becomes embarrassed, the lower jaw should be pulled, or pushed from behind the angles, forward, so that the lower teeth protrude in front of the upper. This raises the epiglottis and frees the larynx. At the same time it is well to assist the respiration artificially till the embarrassment passes off.

XII. If by any accident the respiration stops, artificial respiration should be commenced at once, while an assistant lowers the head and draws forward the tongue with catch forceps, by Howard's method, assisted by compression and relaxation of the thoracic walls. Artificial respiration should be continued till there is no doubt whatever that natural respiration is completely re-established.

XIII. A small dose of morphia may be injected subcutaneously before chloroform inhalation, as it helps to keep the patient in a state of anesthesia in prolonged operations. There is nothing to show that atropine does any good in connection with the administration of chloroform, and it may do much harm.

XIV. Alcohol may be given with advantage before operations under chloroform, provided it does not cause excitement, and merely has the effect of giving a patient confidence and steadying the circulation.

The Commission has no doubt that, if the above rules be followed, chloroform may be given, in any case requiring an operation, with perfect ease and absolute safety, so as to do good without the risk of evil.

FOR RIGGS DISEASE.

Dental Advertiser.

℞ Salicylic acid crystals—alcohol, *q. s.* to make
saturated solution ..... ℥ j
Oil Eucalyptus ..... ℥ vj

The salicylic-eucalyptus preparation is best applied to pyorrhœa pockets by a wisp of cotton wound on a flexible broach. It does not spread, is agreeable to the patient, and is efficient in its results.

PULP DESTROYER.

Southern Dental Journal.

Dr. R. C. Young uses cocaine, antipyrine and arsenious acid in lanoline.

RIGGS DISEASE.

DR. J. R. BELL.

Ohio Journal of Dental Science.

Treatment in every instance must be graduated according to the different stages in which the disease is found. I do not include salivated subjects, or those who are of a scrofulous diathesis, for with these causes the removal of the teeth in chronic conditions seem the only alternative. These systems, as you all know, are

hard glandular tumors, seen commonly on the neck or under the chin, and a preternaturally secretion of saliva. Where there is a a scorbutic tendency, and this is most common, and is characterized by livid spots, varying in size, paleness, languor, depression of spirits, fetid breath, spongy and bleeding gums, teeth slightly loose, we may state to our subject with the utmost assurance that the disease can be checked, teeth tightened, and parts restored to nearly their normal condition. The first step is to remove the deposit, when an assistant is indispensable, for therein lies the secret of success. As the deposit is detached, the assistant should spray the pocket with a tepid solution of bichloride of mercury, 1 grain to 1 pint of water; by so doing all the foreign particles are removed from the bottoms of the diseased pockets, the soft tissues are thus thoroughly sterilized, relaxing the tissues so that the small sinuses are cleansed of their contents. Following this, dry the gum margin with antiseptic cotton pellets and inject fresh peroxide of hydrogen, using it freely to reach every point, then syringe again with the bichloride solution, repeating the process till the effervescing action ceases. If sure that all scales are detached and floated out of their little chambers, the loosened festoons of gum should be pressed against the teeth, when Nature, with her granulating process, will finish the adhesion of gum and periosteum anew. In the first stages of this disease this treatment will be sufficient, except to change the patient's diet from meat to vegetables and fruit, instructing them in the use of the prophylactic brush and the preventive properties in Castile soap as a dentifrice. With chronic cases more stringent remedies will be necessary, where teeth are loosened, process absorbed, thick, creamy pus exuding, margins of gums purplish in color, covering a portion of the crowns of the teeth. Less hemorrhage, and much less sensitive with these conditions present. Stimulating remedies are necessary, and we have found that nothing answers the requirements of the case as well as chemically pure sulphuric acid. It has a threefold object—1st, dissolving any undetached scale of tartar; 2d, removing points of necrosed alveolus; and 3d, stimulating blood to the depleted tissues and healing them by first intention. A cleansing wash should be used thrice daily, after meals, following the thorough application of soap. I find bichloride admirable, one grain to a quart of water, never omitting to label the bottle, poison,

and explaining its value as a germicide. Lastly, an astringent wash to be used just before retiring.

Tinct. arnica	1 oz.
" myrrh	½ oz.
Acid carbolic	20 min.
Oleum gaultheria	1½ dr.
Alcohol	2½ dr.

By earnestly impressing on patients the value of this self treatment, assuring them that hope of saving their teeth lies with themselves, we can accomplish more than can be done otherwise, at the same time gaining their confidence, schooling them in a habit which will be of permanent benefit to at least one generation.

HEMORRHAGE.

International Dental Journal.

Tanic acid internally, Dr. W. L. Roberts strongly advises. Three grains to one-third glass of water; two teaspoonfuls every ten minutes.

Gallic acid, says Dr. Bartholomew, one teaspoonful in a glass of water, never fails.

RIGGS DISEASE.

DR. JAMES TRUEMAN.

International Dental Journal.

Here and there a tooth will present a bright red line at the border-line of the gum. The moment it is touched blood will ooze from it. That is the beginning of the disease. At this stage it is easily cured. It has nothing to do with tartar. It may come from some form of nephritis or a long siege of sickness. Immediately succeeding there is a development of micro-organic life. If we are to treat the teeth properly, we must direct our attention to the micro-organic life first; tartar is secondary. In treatment remove any foreign body, inject into the pockets peroxide of hydrogen, follow this with sulphuric acid, ordinary commercial acid, a twenty-five per cent. solution, and sometimes even stronger; apply it with

a stick; allow it to remain two or three minutes, then immediately apply soda-bicarbonate; after a little time, wash out with warm water, then apply quinia sulphate. If necessary repeat the treatment as described. After the parts have become perfectly healthy, an antiseptic wash must be used. If the pockets remain, there will be a return of the disease.

ODONTALGIA---REMEDY.

DR. J. N. HARRIS.

Items of Interest.

Alcohol (best), 1 oz., chloroform, 2 ozs., sulphuric ether, $\frac{3}{4}$ oz., gum camphor, $\frac{1}{2}$ oz., laudanum, $\frac{1}{8}$ oz., oil cloves, $\frac{1}{2}$ dr. As soon as the pain ceases, fill the cavity with cotton moistened with the carbolic acid and oil of cloves. Drop on this cotton sandarac varnish, and allow it to remain twenty or thirty minutes.

CANAL DRESSING.

Dr. Pierce uses iodoform as a canal dressing after the following formula:

℞ Iodoform,
Oil of cloves,
Oil of eucalyptol, equal parts.

This disguises the odor very effectually, and is a dressing that may be used with good results. It has been esteemed very beneficial in the treatment of pyorrhea.

RIGGS DISEASE.

DR. CHAS. B. ATKINSON.

Dental Cosmos.

What is Riggs disease or pyorrhea alveolaris? A disease following congestion of the myxomatous tissue of the oral cavity, affecting, with wide range of loss, the gingivæ, alveoli and teeth, from slight recession of the gums to entire solution of alveolus and

the consequent loss of tooth or teeth involved; therefore, perhaps more properly "pyogenic gingivitis."

The writer's experience, observation and consultation point to the following teeth in the order named as being affected with this disease:

1st. Inferior incisors; 2d, superior molars and bicuspids; 3d, superior incisors; 4th, inferior molars and bicuspids.

Cuspids resist pyorrhea alveolaris strongly, although they alone are sometimes affected, and then to a very great degree, and more often the inferior cuspids than the superior.

How do we recognize a case of pyorrhea? Perhaps the earliest condition presented to us is a tumefaction of the margin of the gum —from pearly red and light lilac to purplish blue in tint—sometimes puffing to such an extent as to be easily confounded with an alveolar abscess. The tumefied gum readily bleeds on brushing. A probe passed carefully under the gum will disclose a pocket embracing more or less the circumference of the root, in some places nearly or quite to its apical end. Sometimes the gum will be found receded, perhaps on one side only. A purulent discharge, more or less marked, may be demonstrated by pressure of the finger over the root, from its end toward the crown of the tooth. A further demonstration of the presence of pus may be secured by injection, about the necks of the teeth, of peroxide of hydrogen. A general hypertrophy of the oral tissues may be noticed. Suppuration, perhaps preceding, perhaps following, a solution of the dental ligament, which permits the pockets to be formed, and is the antecedent usually responsible for the loosening of the teeth. This loosening may, however, be present as a result of inflammation before suppuration has succeeded. The loosening may be attended with recession of the gum or not, and with or without pain.

What associated local and systematic conditions may we look for?

Locally, aside from the gingival congestions already noted, the teeth may be found elongated, the breath fetid, tartar freely present (although many cases progress to disaster with no appreciable deposit of tartar), pus sometimes oozing from the sockets, putrid taste in the mouth, the tenderness of the teeth already noted, and many times considerable irregularities, the natural result of the loosening of the teeth.

Observation may disclose such systemic conditions, as stomach dyspepsia, catarrh (general or local, as nasal catarrh or other mucous surface debility), constipation, phthisis, adenoid growths, general congestion due to intemperance, kidney disease, rheumatism, cold feet and other extremities, indicating poor circulation and malassimilation. Dr. Rhein has truly said that incurable systemic disorders make only palliation of pyorrhea disorders.

What is the most frequent systemic antecedent? Gastric dyspepsia and nasal catarrh are perhaps equally responsible above other systemic disturbances.

What operative procedures are indicated, and in what order? In answering this question it seems proper to consider a grave case as embracing, if more than, still substantially what one less afflicted would involve. Finding the teeth loose and out of place, their return to place laterally would be a natural first indication, in which normal position they should be tied with waxed sterilized silk ligatures.

It will be found wiser, all things considered, to deal with the upper jaw first; however, isolated teeth in the lower jaw, if specially affected, should be at least placed in position firmly until further attention can be given them.

The purpose of treating the upper jaw first will probably naturally present itself, however, suffice it to say, because of the opportunity the superior maxillary bone gives us to secure a firm base to which we may bring the teeth into proper agreement. The superior teeth once secured in place, the inferior teeth should be undertaken. The initial effort in these cases is to secure firmness of the teeth in their sockets; movement must be avoided if we hope to save any of them. After the teeth are tied, such scaling as may be indicated will be the next step. The pockets should be thoroughly but carefully investigated with proper instruments, all foreign matter removed from them and from about the teeth, having recourse frequently to a $\frac{1}{500}$ or $\frac{1}{1000}$ solution of $HgCl_2$ in H_2O_2. This preparation of peroxide should be used liberally, at first allowed to remain in the pockets and about the teeth for perhaps even three minutes.

The indication to suspend its use will be when the expectoration is clear or evidently free from pus. Where the teeth are elongated and resist longitudinal replacement, after they are tied in place, it

may be found necessary to reduce their length to permit a proper occlusion to be secured. However, in this operation great caution should be used, as the entire contour of the face may be changed by injudicious shortening of the bite. The inflammation in the sockets inducing the elongation many times subsides after treatment for a few days, when it will be found possible to quite or nearly return the tooth or teeth to normal protrusion. Teeth may, however, be restored to their sockets nearly in their normal position by direct pressure, provided they are undertaken while loose, before regaining firmness after treatment.

The varying local medicinal treatment will be indicated by judicious observation from day to day, and is somewhat difficult to more than name in a general way. Remedies must be altered and also alternated as conditions present in individual cases.

For perhaps two weeks patients should be seen daily. Sometimes no application of medicaments will be indicated,—perhaps a little scaling or scraping of overlooked deposit from time to time; but the continued progress of the case will be insured by this constant attention at first.

The visits may gradually be interrupted from alternate days to twice a week and then weekly, until in perhaps the third month of treatment of a grave case fortnightly visits may be proper, which interval should continue until a satisfactory cure is established.

The appearances of the abnormal conditions seem to be best indicated by color, size, and texture.

A dark blue color of swelled and soft or spongy gum should be lanced to relieve the venous congestion, and then injected with aromatic sulphuric acid, full officinal strength. Should suppuration be imminent or present, evacuation of the pus by incision, or the injection of hydrogen peroxide, is a first step, followed by a delicate application of "caustic paste" (potassa fusa $\frac{2}{3}$, acid. carbolic. cryst. $\frac{1}{3}$). A cherry-red color of slightly puffed gum calls for sylicylic acid solution saturated in 95 per cent. alcohol. A warm pink color and no increase in size indicates tannic acid, made into a thick paste with glycerine.

The mucous membrane should be carefully protected from these remedies, and they should be applied exactly and only where needed.

The constant exhibition of antiseptic and stimulant mouth-washes is a necessity, and their daily use should be insisted on.

The following washes are presented:

℞—Hydrarg. bichlor., gr. ij;
Tinct. calendulæ, ℥iv;
Aquæ dest., q. s., ad. ℥viij. M.
Sig.—As directed.

℞—Hydronaphthol, ℥ij;
Tinct. calendulæ, ℥iv;
Aquæ dest., q. s. ad. ℥viij. M.
Sig.—As directed.

℞—Hydrogen perox., ℥iv;
Tinct. calendulæ, ℥ij. M.
Sig.—As directed.

The hydronaphthol wash is especially recommended. Many cases soon reach a stage of progress indicating simply rinsing, syringing, spraying, or gargling with the hydronaphthol wash, which will be found a good prescription for permanent use as a prophylactic. Chas. Marchand's medicinal hydrogen peroxide is reliable, and harmless to normal tissue. It is specifically recommended.

What systemic remedies are indicated?

Tonics are specially indicated, alteratives sometimes. Cathartics in almost every case, especially in beginning treatment, will be found greatly advantageous.

Digestive stimulation is mostly needed, but the following seems to meet the vast majority of cases. At any rate it has stood the test of time, and has been one of the means that has brought success with every case remaining under control.

℞—Cinchonidinæ sulph., ℥ss;
Acid. sulph. arom., ℥ij;
Alcohol, 95 per cent., ℥iij;
Glycerine, C. P., ℥ij;
Aquæ dest., q. s., ad. ℥xv.
Sig.—One teaspoonful ter die, as directed.

If the patient complains of more or less pain in the back, general weariness, chiefly located at or near the loins, the following will be found beneficial:

℞—Potass. iodid., ℥ss;
Aquæ dest., ℥vj.
Sig.—One teaspoonful ter die, as directed.

Alternate these prescriptions for two weeks; then, unless indica-

tions point to the contrary, leave off the iodide, replacing it with the cinchonidinæ. Keep the two prescriptions in use until a satisfactory cure is obtained. Many cases will not need the alterative (iodide), but it will be found all cases are benefited by the cinchonidinæ.

What mechanical means are indicated?

After the tying of the teeth in place, it may be found difficult to restrain them from elongation. This may be secured by striking copper caps made continuous and embracing all of the affected teeth, extending from the occluding surface of the crowns well up on their lingual or buccal surface, as the case may be, but the fixture should be in one piece, extending from firm tooth to firm tooth; sometimes more than one may be found approvable.

These copper retaining caps should be bound to the teeth with copper wires, each separate loose tooth fastened firmly in proper position to the cap fixture, and the extremities of the fixture firmly tied to sound support. Where the whole arch is affected, as many times occurs, and all of the teeth are loose, a continuous rim embracing all of the teeth will be found to give quite adequate firmness. To this all of the teeth should be bound, each separately, so as to insure its being retained in its own place in the fixture, and that it shall not be crowded out by untoward circumstances.

The capping of the occluding surface must, of course, be judiciously done. Undue interference with the bite would aggravate the condition, but judgment is necessary to undertake such a case of surgery, and naturally should be employed throughout its treatment. These copper plates may be left on which great advantage for a year or more, although they are noted here more especially as a temporary fixture, to be left on for say three months at the outside. They are objectionable only for their unpleasant taste, which may be greatly alleviated by a solution of bicarbonate of soda, one dram to four ounces of water, used as a mouth-wash.

What surgigal means are indicated?

Distinctively surgical procedure means the employment of three efforts: 1, free lancing to relieve the venous congestion generally attending pyorrhea; 2, the removal of carious or necrossed bone, alveolus, root, or maxilla, one or all (this last, it is hardly necessary to say, should be by burring with the engine); 3, an aspect of surgical treatment that would require reproduction. For this, sponge furnishes a means of restoration entirely feasible when properly controlled, and efficient if intelligently managed.

ODONTALGIA—INTERNAL TREATMENT.

DR. DUNOGIER.

Dental Review.

Do not neglect as soon as local treatment seems insufficient, after having thoroughly tried it, to have recourse to the following:

Aconitine, crystalized, ¼ milligramme;
Gelsemine, 1 milligramme;
Valerianate of quinine, 5 centigrammes.
For one pill.

Give from one to three pills to an adult in the twenty-four hours.

TO ABORT AN ABSCESS.

Ohio Journal Dental Science.

℞ Ext Aconiti, fl - - - }
Ext. Belladonnæ, fl - - } equal parts.
Ext. Opii, fl - - - - }

M. Sig.—Apply with brush as needed to ease pain; also give fl. ext. phytolacca internally.

HERPES ZOSTER OF THE MOUTH AND GUMS.

DR. A. W. HARLAN.

Dental Review.

Herpes Zoster of the mouth and gums presents itself as an acute circumscribed inflammatory disease, characterized by an eruption of vesicles of herpes on a red inflamed basis; vesicles which are disposed in groups and follow the group of adjacent nerve, this eruption is preceded and accompanied by a very severe neuralgia of the fifth nerve. The evolution of the disease can be divided into two periods: 1st, a period of invasion; 2d, a period of eruption. The period of invasion lasts three days and is accompanied by a marked fever and other general symptoms; it precedes the eruption. There is also this very severe neuralgia of the whole fifth nerve. On the third day we have the period of eruption. The

involved parts become excessively sensitive to pressure, and on the red mucous membrane can be seen series of little groups of vesicles, the size of a millet seed. The neuralgia which up to now had involved the whole fifth nerve, became localized to the diseased region. This eruption lasts about three weeks to one month and the pain is persistent. It is a rare affection; in a period of years only two cases have been observed. In the first one the eruption was situated on the inside of the right cheek and extended under the form of a ribbon parallel to the direction of the upper teeth, for the distance of an inch and a half in length, and half an inch broad. In the second instance, the eruption was located on the right external region of the gums of the lower maxilla, beginning at the right inferior cuspid, extending as far as the second molar on the same side. The affection is prabably of infectious origin and is due to a neuritis of the affected region which brings on trophic changes. The treatment is a palliative one; cotton-wool placed between the cheek and teeth, to prevent friction, and on it can be placed an ointment containing cocaine and morphine.

ODONTALGIA—REMEDY.

American Journal Dental Science.

Hypodermic tablet of ¼ grain morphine sulphate, et atropine sulphate 1-150 grain in four parts, dissolve one part in ten drops warm, well, spring or river water thoroughly. A perfect solution of the partial tablet having been made, it is drawn up into the syringe and the contents thereof slowly and cautiously injected into the hard gums surrounding the aching tooth.

ANTIDOTE FOR CHLOROFORM AND COCAINE.

Pacific Record.

Nitrate of amyl is commended as the most rational and successful antidote to use where chloroform or cocaine seem to threaten life by their unfavorable action on the heart. A few drops of nitrate of amyl administered by inhalation will be one of the most probable means of restoring the heart's action.

NAUSEA FROM IMPRESSION TAKING.

DR. A. W. M'CANDLESS.

Dental Review.

The nausea caused to many persons by the introduction of the impression cup into the mouth may be overcome with a gargle of camphor-water. Should this fail a four per cent. solution of cocaine painted over the surface of the tongue and palate will produce the desired result except in very obstinate cases.

MUCOUS PATCHES OF THE MOUTH.

DR. A. W. HARLAN.

Dental Review.

Mucous patches of the mouth or tongue, when not specific, are frequently troublesome and painful. By drying them and painting the surface, good results are obtained with the following:

Resorcin, gr. xl.
Aqua, ℥ ss.

Or aristol in powder directly to the newly dried surface.

NERVE PASTE AND ITS APPLICATION.

DR. S. H. M'NAUGHTON.

International Dental Journal.

Thymol, 24 grains;
Camphor, 12 grains;
Arsenious acid, 3 grains.

It acts much as other nerve pastes do, except that it hardens and toughens the pulps and makes its removal easier. And there is no decomposition or disintegration of the pulp, even if it should remain in the tooth for three or four weeks.

The devitalizing of the pulp is usually accomplished in from two to four days. If one or two applications do not destroy the pulp, then add a little salicylic acid, which tends to soften and dissolve it; but, by using the salicylic acid, one of the very best qualities of this preparation—that of preserving the pulp from dis-

integration—is lost. If after the application of the arsenic, there is severe toothache, apply to the pulp (without washing or syringing out, and being careful to avoid pressure) another preparation, the formula of which is—

Camphor, 60 grains;
Tannic, acid, 30 grains;
Alcohol, 1 ounce.

This will nearly always prove effectual, but may require a half hour, and the action of the arsenious acid appears to be continued under it. The camphor coagulates and makes a firm plug.

COCAINE AND ITS USES IN DENTAL SURGERY.

BY ARTHUR C. GASK.

British Journal Dental Science.

It is met with in various combinations, but it is in the form of the "hydrochlorate" that I intend to consider it. Hydrochlorate of cocaine of the formulæ C. 17, H. 21, N. O. 4, H. C., presents itself to us as a colorless crystalline powder, readily soluble in water, alcohol and ether. Dissolved in water it is easily recognized by its peculiar bitter taste, and the subsequent feeling of numbness. It possesses powerful local, anodyne and anæsthetic properties, and is of some slight value as an antiseptic. When administered internally, the blood pressure first rises and then falls. It is above all things an anæsthetic for the soft tissues, and in operation in the mouth affecting the mucous membrane, and the immediate subjacent tissues. Applied locally, a 10°20° solution can be employed, but when used hypodermically, the strength of the solution should never exceed 10°.

A 20° solution applied to the mucous membrane, on a piece of cotton wool, will prove of great service in wedging and separating teeth, in forcing the silk up in high conical edges, in removing portions of overhanging gum, in the treatment of pyorrhœa alveolaris, in the lancing abscesses, on many other occasions which will suggest themselves to the operator as the occasion requires. Also a few drops on a piece of cotton wool applied to a carious cavity, will enable us to determine the seat of a probable exposure, and when found, to enlarge that exposure, and so permit of the eschorotic accomplishing

NAUSEA FROM

The nausea
impression cup
camphor-wat
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of discomfort. Then,
possible to painlessly extir-
alone; of course we must first
treatment of those teeth in which
inflamed as to permit of no manipulation
that a 20° solution applied to the gum,
greatly lessen the sensibility of the tooth, and
discomfort to our patient to open up the
Lastly, in the taking of impressions in the
such an intolerance to the introduction of all
painting the palate with a 5° solution, will in
us to obtain a good impression, without any
We shall of course find this treatment
when we desire to obtain an impression of the soft palate.
its slight antiseptic properties, I have recently
for relieving the after-pain of extraction, a ¼ grain
tabloid placed in the socket, will, at all events for some
a complete immunity from discomfort.

The successful injection of cocaine for purposes of tooth extraction presents no little difficulty to the dental surgeon. We have not merely to inject the solution beneath the mucous membrane, but to so inject it that it may penetrate the porous bony tissue, and embrace in its anæsthesia the periosteum and nerves of the offending tooth. In fact, the injection requires as much care as does the shaping of a cavity we are about to fill with gold. The syringe employed should work easily, and the needle be fine, sharp and scrupulously clean. The introduction of a small fine needle will obviously occasion much less pain than the introduction of a coarse one. The needle should be rendered thoroughly aseptic previous to each operation, and one of the most certain methods of accomplishing this is to draw up through the needle a few drops of strong carbolic acid. The solution we inject must be perfectly fresh, inasmuch as the salts of cocaine once in solution rapidly decompose. I may here mention that for purposes of external application alone, a solution containing 5° of saccharine can be very profitably made use of, inasmuch as the introduction of the saccharine not only overcomes the unpleasant bitter taste, but also permits of the solution resisting decomposition for an indefinite period of time.

The salt should be dissolved in water slightly warm, not hot;

hot water favors a decomposition in which the anæsthetic properties of the drug disappear. The strength of the solution varies according to individual taste, from 4° to 20° solution being employed. I employ a 5° solution ($\frac{1}{2}$ grain to 10 minims of water.) Previous to injection, the gum, in the neighborhood of the teeth we are about to extract, should be dried, and a napkin folded round to exclude the saliva. By this means we can see clearly if our solution remains within the tissue, and does not escape back into the mouth through the puncture. All air must be expelled from the syringe. A few drops of a 20° solution applied to the mucous membrane will render the puncture painless, and, indeed, if we discharge one minim of the solution upon the immediate entrance of the needle into the soft tissues, the whole introduction of the needle can be accomplished absolutely without the patient's knowledge. It is generally advisable to inject in three places, and inasmuch as we shall obtain most of our anæsthesia through the outer and thinner wall of the alveolus, two punctures should be made on the labial aspect of the gum, and the remaining one, of course, on the lingual aspect. The needle should be inserted about $\frac{1}{6}$ of an inch below the free margin of the gum, and driven obliquely, upwards or downwards, as the case may be, in a direction towards the apex of the tooth, until the mouth of the needle impinge directly upon the bony tissue. Great care must be exercised to penetrate through all the soft tissues, otherwise the current of our solution will be misdirected, and we shall obtain an anæsthesia of the superficial soft tissues alone, the peridental membrane and nerves of the tooth remaining uninvolved. The needle once in position, and a finger being placed on either side and pressed forcibly down upon the gum to prevent any rising up of the soft tissues, the solution should be slowly discharged. Some little resistance is often offered to the entrance of the solution, but a steady forcible pressure will generally succeed in driving it home. Almost immediately upon the injection of the cocaine we shall obtain a complete blanching of the gum in the neighborhood of the puncture. The solution injected, the needle should not be withdrawn for some few seconds, and when withdrawn, a finger should be placed over the puncture to prevent any escape of the solution. The full anæsthetic properties of the cocaine are not obtained for some six or seven minutes. It is generally advisable to place a few crystals of the salt just round the

neck of the tooth to render painless the driving up of the forceps. The most convenient form of the hydrochlorate of cocaine for purposes of injection is that of the compressed tabloid—half-grain tabloids can be obtained at all the depots.

I have never met with toxic effects in 5° solutions. It is, of course, necessary in dealing with all drugs of the dangerous nature of alkaloids, to adopt great caution, but should symptoms of cocaine-poisoning manifest themselves, we must treat them in the ordinary manner; place the patient in a recumbent position, and administer a stimulant; and one of the best and most certain stimulants we can administer is ether. Fifteen minims of ether, either alone or in conjunction with same amount of aromatic spirit of ammonia, will rapidly restore the patient to a natural condition. Smelling salts can be applied to the nostrils. In bad cases the inhalation of a few drops of nitrate of amyl may be resorted to. Coffee has been suggested as an antidote, but offers no advantages over ether, and of course requires longer time for its preparation.

TEST FOR PEROXIDE OF HYDROGEN.

BY CHARLES MAYR.

Dental Cosmos.

I have found that a paper saturated with a mixed solution of iodide of potash and dithionate of soda answers the purpose. The hydrogen peroxide liberates the iodine in the iodide of potash, but this liberated iodine is immediately seized by the dithionate of soda, and a colorless solution is the result. But if enough hydrogen peroxide is applied, the blue spot will appear, because more iodine is liberated than can be used in oxidizing the dithionate of soda to tetrathionate of soda. Thus the problem of such a test-paper resolves itself to a proper proportion between iodide of potash and dithionate of soda; to make the reaction more pronounced still, a little starch-paste is added.

I have thus succeeded in producing a paper, which, with one drop of hydrogen peroxide of twelve volumes of oxygen, produces the blue spot in twenty seconds; with six volumes, in from one to two minutes; and with four volumes essentially no blue spot is produced, only possibly a blue rim.

TEST FOR BICHLORIDE OF MERCURY.

BY CHARLES MAYR.

Dental Cosmos.

A dentist is usually too busy to make a complex test to see whether his solution of bichloride of mercury is still reliable or not.

For this purpose I saturate a nice grade of paper with a solution of a given amount of iodide of potash in water; with the proper gauging of this solution, after it has dried on the paper, a drop of the solution of bychloride of mercury (1 to 500) will produce a scarlet spot when dropped on the paper; a solution of 1 to 1000, a yellow spot; a more dilute solution, no spot at all. To obtain this result, a certain strength of the solution of iodine of potash gauged for the paper to be used is required. As the iodide of potash paper is apt to undergo slight changes when exposed to the atmosphere, due to the liberation of free iodine, it is desirable to make the solution of iodide of potash slightly alkaline, which would prevent, to a great extent, the paper from turning blue.

"HEAVEN'S CORDIAL."

DR. J. N. HARRIS.

Items of Interest.

Best alcohol	1 ounce.
Chloroform	2 ounces.
Sulph. ether	¾ ounce.
Gum camphor	½ "
Laudanum	⅛ "
Oil of cloves	½ dram.

For toothache, plug the carious tooth with cotton saturated with this cordial; if for after pain in extracting, press a good quantity of the saturated pledget well up in the socket, and allow it to remain for an hour or two. If there is fear of hemorrhage, place a little powdered tannin on the side of the pledget first entering the socket. You can also relieve the most stubborn toothache of pregnancy by first bathing the tooth and gums with cotton soaked with it, having the patient draw in the breath a few times, so as to pass the air over it; change the saturated cotton once or

twice, if necessary. It is sure to soothe the pain and the whole nervous system. For toothache in pregnancy, when suffering has been fearful and the prostration dangerous, I have always administered it with relief. Rubbed on the skin it is very penetrating, and of frequent use in all painful swellings and bruises, if the skin is not abraded. In the dental office it makes the dentist master of the situation. I have studied, worried, and experimented, and bought everything, in hopes of finding "the nectar distilled in the garden of the gods;" but I never found it till I found this.

TREATMENT OF TEETH DURING PREGNANCY.

DR. W. H. DWINELL.

International Dental Journal.

The first thing to be done is to consider the importance of the general nutrition of the mother with well-selected diet, and especially whole wheat food, to make sure of the phosphate portion of them which is contained in the four outer capsules of the kernel, and which in the manufacture of superfine flour are wholly rejected. Oatmeal, too, is an excellent phosphate cereal. The next thing is to charge the system, through the stomach, with bone phosphate of lime in solution or in the form of a powder, spreading the same upon the food to be eaten, or distributing it over the same with a receptacle in the form of a pepper-box, literally using it as a diet, until the system is saturated with it; at the same time, it will be well to use lime-water, natural Vichy water, ever dieting towards the alkaline.

Use tooth-powder in which bicarbonate of soda is a generous ingredient, and have all washes of the mouth contain the same. For general tonics I use sometimes other forms of the phosphates, such as the hypophosphates and lactophosphates, with excellent results. Under some conditions I use nux combined with myrrh and tincture of iron; this last, when used with Vichy water, is entirely harmless to the teeth.

In using the phosphates, select that which is derived from the bones of animals, never that from the phosphate rock; the bone-phosphates are potent and are readily taken into and assimilated

with the system. The phosphates from the rock are inert, extraneous, non-assimilable, and useless to our animal economy, although chemically they are the same.

For acid and sensitive teeth, subdue with soda applied in saturated solution to the teeth, then with such obtunders as may be most effective; excavate and fill with pink gutta-percha to bridge over to the period when the patient is able to endure more permanent operations.

Extracting the teeth during pregnancy should be avoided, if possible. Try such palliative treatment as may bring the teeth into subjection; but if this cannot be done, and the pain from them becomes hazardous, do not hesitate to remove them.

DRESSING FOR CHILDREN'S TEETH.

DR. L. L. DAVIS.

Dental Review.

R	Carbolic Acid (crystals)	ʒj
	Oil of cassia	ʒj
	Glycerine	ʒj
	Alcohol	ʒij

which makes a more pleasant dressing than any of the essential oils or creosote. Children are not nauseated or afraid to return after its use, and it quickly relieves pain.

HEMORRHAGE AFTER LANCING THE GUMS.

DR. J. W. WHITE.

Dental Cosmos.

Persistent bleeding after lancing, though infrequent, has occurred, and is probably due, generally, to the sucking of the gums, provoked by the taste of the blood. In such cases the substitution of the nipple of the nurse will give the child better employment. The extent of the hemorrhage can be ascertained by touching the wound occasionally with the napkin-covered finger. If the child should refuse to nurse, it can be prevented sucking its

gums by the introduction of any soft substance, such as a roll of linen or muslin, placed like a bit in the mouth, and kept in position by attachments of tape tied around the head. If the bleeding continues longer than seems desirable, a little very finely powdered alum may be rubbed into the cuts, and will generally be all that is required to control the bleeding. Tannic acid may be employed in the same manner; or fibres of cotton, which have been moistened and dusted with one of the vegetable or mineral astringents, may be packed into the cuts; or styptic colloid—a saturated solution of tannin and gun-cotton in ether—may be applied with a minute camel's-hair brush over the wounds; or some one of the numerous remedies which act mechanically may be used: lycoperdon, puff-ball, matico, resin in powder, burnt cork, and spider's web, are familiar examples. Pressure with the finger over the cuts would be an efficient procedure. As a last resort, the actual cautery would promise relief. Nitrate of silver, or the perchloride or persulphate of iron, should never be used, because of their liability to cause a slough, and consequent secondary hemorrhage, more difficult to control than the primary bleeding. In an extreme case, to divert the circulation to other parts of the body, hot foot-baths or mustard cataplasms to the extremities may be resorted to, and the feet and limbs kept warm by the application of a heated brick or flat-iron, or by a bottle of hot water. In a case of hemorrhagic diathesis, where a slight oozing of blood persists in spite of local treatment, it would be necessary to administer remedies intended to correct an abnormal condition of the blood and to promote contractility of the blood vessels. Of the former, the tincture of the muriate of iron is probably the most efficient; of the latter, acetate of lead, aromatic sulphuric acid, gallic acid, ergot, erigeron and turpentine are of the class from which benefit might be expected. Both indications would be met in the following formula:

℞ Tinct. ferri chloridi ..... f℥ss.
Acid. acetic. dil. ..... f℥j.
Liq. ammonii acet. ..... f℥j.
Ext. ergot. fld. ..... f℥ij.
Syr. simp. ..... f℥ss.
Aquæ, q. s. add ..... f℥iij. M.

Dose, a teaspoonful every three hours for a child six months old.

HERBST OBTUNDENT.

To make, first get a suturated solution of cocaine hydroclorate in chemically pure sulphuric acid, and add sulphuric ether to the point of saturation, allowing the excess of ether to escape by evaporation.

PULPS—DESTROYING AND REMOVING.

DR. A. W. HARLAN.

Dental Review.

℞ Arsenic Acid ..... gr. xc.
Hydrochlorate Cocaine ..... gr. x.
Iodoform ..... gr. vii.
Oil of cloves add q. s. to form a stiff paste.

℞ Acidi Arseniosi ..... gr. xc.
Cocainæ Hydrochlor ..... gr. x.
Iodoformi ..... gr. v.
Ol. cassia q. s. to form a stiff paste.

Apply $\frac{1}{60}$ gr. to the pulp, and allow it to remain 48 hours. Always seal the cavity with gutta-percha. When the dressing is removed, keep the cavity dry. Wash it with dialysed iron, puncture the pulp, and apply alcoholic sol. of tannin. Seal the cavity for eight days, when the pulp may be removed painlessly. The root may be filled at once, if nothing has been allowed to get in the cavity during this time.

MOUTH WASHES.

ASTRINGENT, STIMULATING.

Dental Record.

℞ Boro-glyceride .....
Tr. krameriæ .....
Eau de'cologne ..... aa. oz. j
Spts. vini rect ..... ad. oz. viij.
Mix. A teaspoonful to be added to a little water.

VIOLET.

Seifenfabrikant.

		Parts.
℞	Tincture of benzoin	7
	Tincture of rhatany	30
	Tincture of myrrh	60
	Rose water	250
	Tincture of orris root	500
	Alcohol	150

SIMPLE AND EFFICACIOUS.

British Journal Dental Science.

A simple and efficacious mouth wash is obtained by adding carbolic acid in crystals four drachms to three ounces each of glycerine and water, and then after carefully mixing, rubbing it on with a soft tooth brush.

FRAGRANT AND ANTISEPTIC.

DR. A. W. HARLAN.

Dental Review.

R.	Safrol	360 min.
	Oil of pinus pomilia	120 min.
	Oil of curacoa	120 min.
	Oil of vetivert	6 drops.
	Oil of wintergreen	24 drops.
	Oil of anise, Saxony	6 drops.
	Oil of rose, geranium, Af	6 drops.
	Napthol	60 grains.
	Deodorized alcohol	24 fld. oz.
	Solution of saccharine	½ fld. oz.
	Glycerine	8 fld. oz.
	Purified talcum	2 troy oz.

GERANIUM SUELDA.

Chemist and Druggist.

The root of geranium suelda (Bolivia), dried and coarsely powdered, is steeped in twice its weight of 98 per cent. alcohol, thus affording a fine red tincture. Ten drops of the preparation in a glass of water will make a mouth wash surpassing anything known.

MONTE'S PROPHYLACTIC.

Medical and Surgical Reporter.

℞ Acidi borics ..... gr. xxxviij.
Aquæ destillatæ ..... f ʒ vij.
Tincturæ myrrhæ ..... *m* xxxxviij. M.

℞ Sodii salicyl ..... gr. xxxxiij.
Aquæ destillatæ ..... f ʒ vij.
Tincturæ myrrhæ ..... *m* xxxxviij. M.

Sig. Wash out the mouth several times daily, with either of the above formulas.

ANTISEPTIC.

DR. W. D. MILLER.

British Journal Dental Science.

Thymol ..... gr. ii.
Benzoid acid ..... gr. xlvi.
Bichloride of mercury ..... gr. ix.
Tr. of eucalyptus ..... ʒ ss.
Oil of peppermint ..... gr. xi.
Alcohol ..... ʒ. xxvi.

Filter and add sufficient of the solution to a wine glass of water to cause a distinct turbidity. The mouth is rinsed with this mixture twice successively, and may thus be kept perfectly sterilized, the amount of bichloride being too small to cause poisonous effect.

DENTIFRICES.

ROSE.

Chemist and Druggist.

℞ Precipitated chalk ..... 15 ozs.
Soap, powdered ..... 1 oz.
Saccharin ..... 10 grs.
Thymol ..... 15 grs.
Camphor ..... 30 grs.
Vanillin ..... 5 grs.
Oil of rose ..... 6 drops.

Rub the camphor and thymol together in a mortar, and warm

gently so as to render the mixture liquid; then add the chalk in small portions at a time, reserving about one ounce; next add the other ingredients, the perfumes being first separately rubbed with the remainder of the chalk.

DR. HARLAN'S.

Dental Review.

℞ Cretæ precip.
Pulv. orris rad., of each ℥ ii.
Pulv. saponis Cast. alba ℥ ss.
Pulv. os. sepia ℥ ii.
Pulv. myrrhæ ℥ i.
Pulv. sacch. alba
Pulv. boracis, of each ℥ i.
Carmine grs. x.
Ol. gaultheria ℥ i.
Glycerine
Honey, of each ℥ i.

M.—Ft. paste.

DR. DARBY'S.

Dental Review.

℞ Prep. chalk ℥ viij.
Prep. orris root ℥ iv.
Powd. Cuttle-fish bone
Puv. sugar
Castile soap aa ℥i .
Powd. yellow cinchona ℥ j.
Bicarb. soda ℥ ss.
Cochineal ℥ j.
Oil of roses 20 drops.

Mi x.

LOCAL ANÆSTHETICS.

Southern Dental Journal.

R Cocaine hydrate, 4 per cent. sol 3 ounces.
Carbolic acid 5 drops.
Chloral hydrate 5 grains.

Mix. Use hypo-dermically around the tooth with care.

DR. STORIE'S NO. 1.

Southern Dental Journal.

R Chloral hydrate, gum camphor, a.a. q.s. for one ounce. Rub well in a mortar to liquefaction and add carbolic acid 5 drops. Apply to the gums.

DR. STORIE'S NOS. 2 AND 3.

Southern Dental Journal.

	Gum camphor	2 drachms.
	Ether Sulp. Conc.	4 ounces.
Mix.	Apply round gum with cotton.	
R	Pure alcohol on a piece of cotton put around the tooth.	

PARSONS'.

Southern Dental Journal.

R	Chloform	12 parts.
	Tincture aconite	12 parts.
	Tincture capsicum	4 parts.
	Tincture pysethrum	2 parts.
	Oil Cloves	2 parts.
	Camphor	2 parts.

Dissolve the camphor in the chloroform, then add the oil of cloves, then the tinctures.

R Cocaine mur., gr. 50.
Acid boracic, gr. ii.
Liq. hyd. bichlor, M. 40.
Aquæ destal ad. M. 250.

M. To be applied locally by means of pledgets of cotton, held tightly to the gum on each side of the tooth to be extracted.—Dental Record.

Dr. Martin, in L'Union Medicale suggests the following formula, which he has used with great success:

R Hydrochlorate of cocaine, gr. ¾.
Antipyrine, ar. vj.
Distilled water, *m* xvj. M.

Neutralize creosote on the lips or cheeks with vinegar—*Atkinson.*

ORAL SURGERY.

FRACTURE OF THE JAWS.

DR. D. W. FELLOWS.

International Dental Journal.

I have recently been called upon to make and adjust the interdental splint in two cases, in each of which the lower jaw was broken through the body in the region of the right lateral incisor and through the left ramus.

The first was a merchant of Portland, who, on entering a railway station in a neighboring town, suddenly became faint or dizzy and fell forward, breaking the lower jaw as described, and completely severing the superior maxillary bones from all connection with the bones of the skull. Just what the line of fracture was in the upper jaw it was impossible to determine; but it was probably through the body of each maxillary bone.

The other case was that of a man employed in discharging coal from a vessel. A staging gave way and he fell to the deck.

The crown of the upper left central incisor was broken off, in addition to the double fracture of the lower jaw. In each of these cases impressions were taken of the upper and the lower teeth without any attempt to reduce the fracture. Plaster models were made and the model of the lower jaw sawed through at the point of fracture, and adjusted in normal occlusion with that of the upper jaw. The two were then put in an articulator, and separated to a small extent to allow space between the front teeth for taking food. In one case a superior incisor had been previously lost, and in the other, one was broken at the time of the injury. This condition was somewhat convenient, but by no means necessary, in the treatment. After forming the splint in wax to cover the crowns of all the teeth, and to fill the space between the grinding surfaces of the teeth, the whole was removed from the articulator, flasked, packed, and vulcanized.

In finishing, the rubber was cut away in front, so that the upper front teeth were not covered, thus leaving a space. A narrow

opening was also made at each side to allow the parotid saliva to flow into the mouth.

The splint was adjusted to the teeth of the upper jaw, and then the fragments of the lower jaw were brought into position, the teeth inserted in the sockets prepared for them, and the jaws kept closed for a time by means of the Garretson bandage. These were worn, in each case, about six weeks without removing, when the bone was found to be so well united that they were no longer needed.

CURE OF CLEFT PALATE BY A DOUBLE FLAP OPERATION, WITH THE BURIED TENDON SUTURE.

DR. H. O. MARCY.

Dental Comsos.

Miss J., aged twenty-five, a strong and healthy woman, had a congenital cleft of the soft palate, with only a slight indention of the bony structures. Each half of the uvula was well developed, and by moderate tension the edges of the cleft could be brought into apposition. After a careful explanation of the intended procedure, the patient cheerfully consented to the operation. Aided by Dr. Charles Bullock and Dr. S. L. Nelson, I commenced the operation by the introduction of a tracheotomy tube. With careful washing and irrigation the nasal and oral passages were rendered aseptic by the use of a sublimate solution, of strength $\frac{1}{1000}$.

After the introduction of the mouth-gag and packing the pharynx with an aseptic sponge, the soft palate was seized each side, the edges slightly freshened by scissors and split laterally to the depth of about one-third of an inch. The posterior flaps thus formed were carefully joined by a very fine "over and over" tendon suture. A somewhat larger suture commencing at the angle of the base of the division of the flap was carried laterally from side to side through the center of the soft palate, a little beyond the line of lateral division. This line of suture extended quite to the uvula. The approximation of the sides necessarily everted the edges and by so much increased the fresh surfaces brought in contact, while at the same time it completely buried the line of sutures.

The everting edges presenting in the roof of the mouth were then carefully joined by a very fine continuous-tendon suture. Two double-looped stitches taken as far away from the central line as possible were then introduced, in order to prevent any lateral strain upon the central wound. The mouth and nose were closed, and only rarely required to be cleansed of mucus during four subsequent days; after cleansing they were dusted with iodoform by means of the iodoform-blower.

Respiration went on comfortably through the tracheal tube. A large injection of weak beef tea, given once in six hours, served the purpose of food and drink.

The wound remained non-infected, and repair ensued as in aseptic wounds in other parts of the body, with the exception of the tip of the uvula, where a small slough formed from over-constriction of the suture.

DOUBLE FRACTURE—LOWER JAW.

DR. SMITH.

International Dental Journal.

I was called in consultation to assist in holding a double fracture of the lower jaw that the surgeons of the Massachusetts General Hospital had treated unsuccessfully with their usual process of wiring teeth together. The case was that of a gentleman who had been thrown from a carriage. Not only was the jaw fractured at the right and left of the symphysis, but the soft parts of the face, especially about the neck, were severely lacerated. The usual procedure of using the interdental splint with a bandage passing under the chin and over the head was prohibited on account of the severe inflammation of the soft parts, producing two sinuses, in which the surgeon had placed tubes for the discharge of pus. I was not called until late in the case, and I found the parts so swollen that it was impossible to take a full impression at once of the jaw. So I took the impression of the lower jaw in three sections by taking modelling compound and using my forefinger as a cup. From these impressions casts were made and put together. A die was then constructed, and on that was struck up a very stiff gold splint going inside of the teeth and over the crowns, but not over the out-

side. Through this splint, and corresponding to the spaces between the teeth, holes were made, through which passed platinum wire to serve as ligatures in securely fixing the splint in position. Everything being in readiness, the fractures were adjusted, the splint applied and firmly fastened—by means of the platinum ligature—to the teeth. The patient wore the splint some twelve weeks with perfect comfort, and the results were satisfactory to both surgeon and patient.

UNITING A BROKEN JAW.

DR. H. L. HARLAN.

Items of Interest.

Mr. Y. was thrown violently from his buggy, breaking and badly fracturing his lower jaw in three places, and knocking out the second bicuspid tooth.

Break first, between the central and lateral incisor; second, at first bicuspid and the first molar; third, between the first and second molar. The bone cutting through the cheek and throat in three places, which made soreness and swelling so great as to make impossible cardboard pressure from below that is usually resorted to.

I made two props of equal size, placing them back in the mouth to hold the jaw, open to equal width on both sides, pulled the fractured and broken parts together, and with the aid of an assistant, held them there. After clearing the mouth of mucus, flowed over and around the teeth thin plaster, without the use of an impression cup. After the impression had set, broke it into sections and removed it. Made the splint the thickness of ordinary sheet wax, to cover the broken parts, and extended to the first molar on the sound side, perforated with holes for the reception of wire. By using very fine silver wire I ligatured each tooth the same as is done for rubber dam, letting each piece extend out of the mouth six inches. Then, by running the wire through each respective hole in splint, pushed the plate down, drawing up the wire at the same time, which brought the broken parts up in position. Then made the parts tight and stationary. After six weeks removed this appliance, and found the jaw strong and sound. Some of the teeth and alveolar process were a little loose.

FRACTURED ALVEOLAR PROCESS.

DR. GEO. W. ALLEN.

Items of Interest.

A boy, who, while sliding, met with an accident, by which he had knocked out his four upper incisors. At the time they had been out from five to eight hours, and the hemorrhage had ceased. On a careful examination I found that not only were the teeth knocked out, but that the labial portion of the process was fractured and displaced. Replaced the process, and after syringing the sockets with a solution of phenol sodique, washed the teeth thoroughly with the same and replaced them in their natural position, being careful not to crowd the fractured process out of place. Selected some heavy linen thread, well waxed, and commencing with the twelve-year molar, braided them all together, and by so doing the entire arch was held firmly in place.

Every other day, for two weeks, syringed them with a weak solution of phenol, and on removing the supports found them perfectly firm, and a thorough examination would fail to show that they had been knocked out and replanted or implanted. The patient suffered little after the operation, and for the past two weeks has experienced no inconvenience in eating the hardest kind of food.

FRACTURE OF THE LOWER JAW.

DR. ANDREWS.

International Dental Journal.

A gentleman in trying to stop a vicious, runaway horse, received a kick, which broke his lower jaw, about an inch to the left of the symphysis. Besides the fracture there was a loose, V-shaped piece of the jaw containing three teeth, the cuspid and two bicuspids. A few days after the accident the patient was brought to me by his physician to have a splint made to keep the jaw and teeth in place. The patient having a close-cut beard, we thought it best to cover this with a piece of damp cotton cloth, which was tied round the head like a bandage, one object being to keep the jaws together, and make as perfect an articulation with the upper teeth as possible; another, to prevent the modelling composition

from clinging to the beard. A piece of sheet tin, such as we make air-chambers of, was then rudely fashioned to the form of the lower jaw, after which modelling composition was heated, placed in this tin form, carried up in place, and allowed to cool about the jaw. Another bandage was then tied outside of this and over the head. We found that the patient could open the mouth to allow an impression to be made of the teeth, after we had tied the loosened teeth to the firm ones. From the impression a splint of vulcanized rubber was made covering the teeth. In three weeks the splint was removed and the jaw was found to be united, the articulation being nearly perfect.

A NEW METHOD FOR THE TREATMENT OF FRACTURES OF THE MAXILLÆ.

DR. EDWARD H. ANGLE.

International Dental Journal.

Muscular contraction is a most difficult obstacle to overcome in reducing and maintaining in proper apposition most fractured bones.

In fractures of the inferior maxillæ it is also a most difficult obstacle in the way of maintaining perfect apposition of the parts, and should always be carefully considered in the construction of an appliance for this purpose. This difficulty is intensified by the large number of movements to which the human jaw is susceptible, and the great number of causes which contribute to their production.

The methods used by myself in treating fractures of the maxillæ have been so successful and so gratifying that it would seem they approach for efficiency and simplicity more nearly the ideal than any yet devised.

In order that this system of treating fractures of the maxillary bones may be more easily understood, I will divide them into three classes. The first class comprises all simple fractures in which the teeth are good and sufficiently firm in their attachments (especially on each side of the fracture) to afford anchorage for the appliance.

The second class comprises all fractures where the teeth are

unsuited, from diseases or any other cause, for anchorage, but yet sufficient to give the correct articulation of the jaws.

The third class comprises all fractures where the jaws are edentulous. The following cases treated by myself will enable the reader to comprehend the method peculiar to each class:

Case No. 1 will illustrate Class No. 1. May 29, 1889, Nels Parsons, aged twenty-one, was admitted to the Saint Anthony Hospital of this city. He had fallen from a pile of lumber, a distance of fifteen or twenty feet, and, besides severe bruises, suffered a simple fracture through the symphysis, terminating, however, in front between the central and lateral on the left side, as shown by

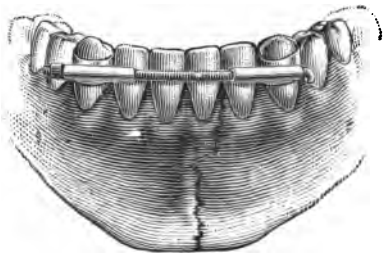


Fig. 1.

the line in the engraving, Fig. 1. Upon examination, I found the fractured bone was quite widely separated at the top, and the left central incisor was loosened. The following treatment was adopted: The ends of the fractured bones were placed in their proper position and temporarily fastened by lacing the teeth with silk ligatures.

Bands of very thin German silver were made to encircle and accurately fit the cuspid teeth. A small tube of German silver, one-half inch in length, was soldered to each band and in exact alignment; a piece of wire accurately fitting the bore of these tubes bent at right angles at one end and having a screw cut upon the other end, was slipped through each tube and secured therein by adjusting a nut on the screw. The bands were cemented in position upon the teeth by means of oxyphosphate cement, as shown in Fig 1.

After the cement had become thoroughly set, the nut was then tightened until the fractured ends of the bone were drawn snugly together.

The appliance was worn without displacement or trouble for twenty-one days, when it was removed, the bone having become

firmly united. I may add that, during the time the appliance was worn, so firmly was the jaw supported, the patient suffered little if any inconvenience, and after the third day partook regularly of his meals, using his jaw freely, but of course avoided the hardest particles of food. After removing the appliance a careful impression of the jaw was taken, a model made, and the appliance transferred to the model, exactly as shown in the engraving. The lower part of the jaw is, of course, diagrammatic, and was added by the engraver to show the line of fracture.

It should be borne in mind that the principle upon which this appliance is based is not the same as when the teeth are simply wired together, but very different; for, in wiring, the upper parts of the fracture only are tipped or drawn together, and no pressure or support is given to the lower parts; while in the method here shown it will be seen that, by reason of the bands and pipes being rigidly attached to the anchor teeth, tipping is impossible, and pressure is exerted equally upon both parts (upper and lower) of the fracture as they are drawn together by the screw; or, as my friend, Dr. Charles G. Brown, (who first suggested to me this use of the screw), puts it, "It is a Malgaigne splint, if you please, except that the hooks are not foreign bodies."

This device may be applied in any locality in either jaw, provided suitable teeth for anchorage be not too remote from line of fracture. The screw may be bent to accommodate the curve in the arch, should the fracture occur in the region of the cuspid.

The treatment for cases of the second class is illustrated in Case No. 2. On July 4, 1889, William Farley, aged forty-five, was admitted to the Minneapolis City Hospital. A blow from a policeman's club had produced two simple fractures of the inferior maxilla. The first was an oblique fracture of the right side, beginning with the socket of the second bicuspid, extending downward and backward, involving the socket of the first molar, breaking out the second bicuspid and greatly loosening the first molar. The second molar had been lost years before, while the third, as well as the remaining teeth, were much abraded and loosened by salivary calculus, thus making the application of the appliance described in Case No. 1 impossible. The second fracture was situated on the opposite side, high up in the ramus. Because of the swollen condition of the parts, I could not detect the exact line of fracture,

but the grinding of the ends of the bone and the great pain occasioned thereby were unmistakable evidences of a fracture. The patient, as in all such cases, was unable to close the jaws. The fracture on the right side was widely separated, and the anterior piece much depressed by reason of the contraction of the depressor muscles, while the posterior piece of bone was drawn firmly up, the molar teeth occluding. (See Fig. 3.) The following treatment was used: Bands were made to encircle all four of the cuspid teeth, they being the most firmly attached in their sockets. The fractured ends of the bones were placed in apposition, and the lower jaw closed carefully. The occlusion of the lower teeth upon the upper required so considerable force and occasioned so much pain that it

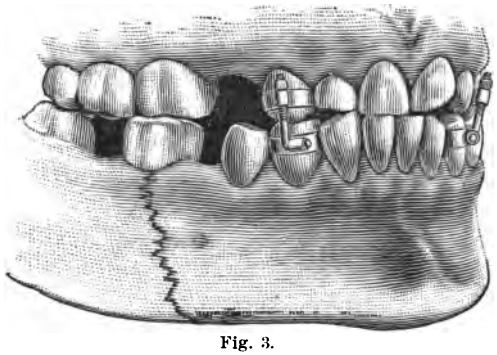


Fig. 3.

became necessary to anæsthetize the patient. Points on the bands for the necessary attachments were carefully noted. The bands were then slipped off the teeth, and little pipes soldered at the necessary points, after which the bands were cemented in their proper positions upon the teeth, and two small traction screw-wires, were slipped into the pipes. The jaws were closed and the nuts tightened on the screws, until the jaws were drawn firmly together, and each tooth occupied its exact position in occluding upon its fellow of the opposite jaw. Both fractures were then carefully examined and found to be in perfect apposition, and presented the appearance shown in Fig. 3. The most natural position for the jaw and the muscles had been secured, thus placing the parts in their natural position of relaxation and rest.

During an attack of coughing in the night following, one of the bands was wrenched loose, but was replaced the next day without

trouble. No further accidents occurred. The patient readily took nourishment through the spaces between the teeth. Thus the fractured jaw was firmly supported without the least motion for twenty-two days, when the appliance was removed, showing most excellent results.

The patient was a great lover of the clay pipe, which accounts for the much-worn condition of the incisors.

The following case possesses several points of special interest, although the fractures occurred in regions similar to the case just described, and the appliances, though involving similar mechanical principles, will be found to be greatly simplified.

December 28, Thomas Brennan was admitted to the Dental Infirmary of the University of Minnesota, suffering from the effects of a blow received on the left side of the jaw from a cant hook while working in a lumber camp in Wisconsin, which produced fracture of the jaw in two places. The first fracture was on the left side, beginning between the first and second bicuspids, and extending downward and backward, involving the lower part of the anterior root of the first molar. The second fracture was on the right side directly through the angle of the jaw. The fractures had occurred thirty-two days previous to his admission to the infirmary, during which time nothing had been done to reduce them. He reported that he had called upon a physician, who supposed the trouble was merely an abscessed tooth, and had lanced the gum with the view of reducing the swelling. Later the patient had called upon a dentist in one of the smaller towns, who also failed to diagnosticate the fracture, and extracted both bicuspids in the hope of giving relief.

Upon examination, I found considerable swelling in the region of this fracture, with the usual result: The patient being unable to close his mouth by reason of the anterior piece of the fractured bone being drawn down by the contraction of the depressor muscles. A false joint had also become established, and the bones could be easily worked without causing pain.

At the point of fracture, on the right side, there was little or no displacement; the swelling was also slight. With the assistance of Professor Leonard the patient was anæsthetized; the ends of the bones were then rubbed forcibly together with the view of breaking up the false attachments and stimulating activity in repair.

The ends of the bones were now placed in perfect apposition, and the jaw closed, taking great care to articulate the teeth in their correct position against the upper ones.

The jaw was now firmly bound in this position to the upper teeth, in the same manner as described in Case No. 2, with this difference, that the method was improved upon and simplified by using clasp bands, as shown in Fig. 4.

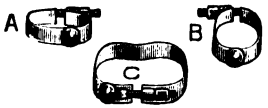


Fig. 4.

No cement was used, and, instead of the screws, small metallic buttons were soldered to the sides of the bands (as shown in the cut), around which fine binding wire was wrapt in the form of a figure 8. (See Fig. 5.)

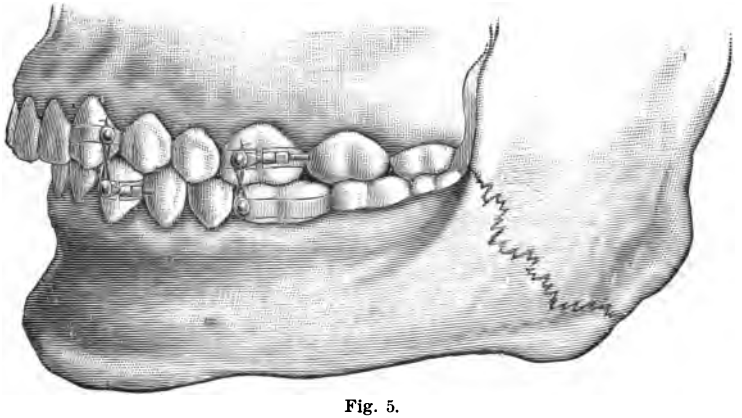


Fig. 5.

The bands seen upon the molar teeth in the engraving were not used in this case, but are shown for the purpose of illustrating how they may be used in cases of comminuted fracture. At the end of seventeen days the bands were removed and the patient discharged, the bone having been firmly united.

It might be urged as an argument against this method that, the teeth being closed and the jaws being firmly bound together, the potient would be unable to take sufficient nourishment. It, however, rarely happens that a patient is found without some teeth missing, thereby leaving abundance of space for the passage of the

liquid foods, and even if all the teeth are sound and in perfect position, it has been proved that there is plenty of space between the teeth and behind the molars and between the upper and lower incisors for taking all nourishment necessary. In such cases more time would be consumed in taking nourishment, but this obstacle is compensated for by the main points of advantage in its favor, such as cleanliness and greater comfort to the patient, as compared with the many bulky and awkward appliances in use.

Third, its extreme simplicity enables any one with ordinary mechanical ability, when provided with a set of clamp bands, to easily and quickly set all ordinary cases of fracture.

Class No. 3, comprising fractures of edentulous jaws, are fortunately very rare. The method of treatment I propose is similar in principle to that already described in Class No. 1, except that in place of the teeth small bone hooks are used, drilling for their reception a suitable cavity on each side of the fracture, comparing in position to the original sockets of the teeth, the same as if the operation of implanting teeth was intended; the cavities thus made need not be nearly so large or deep. They should also be drilled obliquely to correspond to the course taken by the hooks. The hooks before insertion should of course be made antiseptic.

HOW TO MAKE A VULCANITE SPLINT IN TWO HOURS.

MR. DAVID HEPBURN.

British Journal Dental Science.

A very important consideration, when treating dislocations of the teeth caused by a blow or similar accident, is to introduce a splint in as short a time as possible. The method may, of course, be applied to the making of regulation plates, but there is usually no such hurry for these. After replacing the tooth, if need be fixing it in place by a ligature, take an impression in wax. If composition be used this must be removed whilst still soft. Cast the model directly in the lower part of flask. Remove wax by dry heat, as it is a most important point to have the model warm and

Cut the pattern of required plate in lead. Duplicate this in

rubber. Warm and dry model, paint over it a solution of Valcanite in chloroform and then press on it the above rubber plate, making one side adhere first before doubling it over the teeth. If the plate needs to be thicker than this one layer of rubber, pack small pieces onto this. Trim the edges with a warm knife and seal them to model with the solution. Place the upper part of flask over this, fill up with plaster, then fasten and place in the vulcanizer, which may have been previously warmed. Vulcanize, cool rapidly, remove, file, polish. The splint is ready for placing in position.

TREATMENT OF FRACTURES OF THE MAXILLÆ.

DR. KASSON C. GIBSON.

Dental Cosmos.

That the best result possible may be obtained in the treatment of fractures of the maxillæ, necessitates, on the part of the operator, a correct understanding and appreciation of the normal relations of the jaws and teeth. It is therefore important that the dental practitioner should add to his general knowledge the basal principles involved in the treatment of such cases, and at least a theoretical familiarity with the appliances best calculated to promote the comfort of the patient and to secure the best results. While in the treatment of fractures of the maxillæ the services of a surgeon are invariably sought, yet the most approved appliances and the best methods of treatment have emanated from dentists. Reflection upon the anatomy of the lower jaw will convince anyone of the difficulties to be encountered in reducing a fracture and retaining the fragments in their normal positions. It is possible ordinarily to construct an interdental splint which will so hold them and at the same time permit the jaw to be used for the reception and mastication of food.

Fractures of the jaw are unmistakable, the prominent symptoms and signs being pain, swelling, drooling, hemorrhage (if compound), displacement of the teeth, mobility of the fragments, and crepitus. When any doubt exists as to the location of a fracture of the lower jaw, grasp the bone on each side, with the forefingers

introduced into the mouth and resting upon the teeth, when there will be no difficulty in recognizing the false point of motion or crepitus between the fragments. In fractures of the upper jaw, introduce the thumbs instead of the forefingers.

Fractures are simple when the bone only is divided without piercing the integuments; compound, when the injury is accompanied by laceration of the tissues, through which there is a communication between the external air and the fracture; comminuted, when the bone is broken or crushed into several pieces at the same point and communicating with each other.

Fractures of the lower jaw, if the body of the bone is involved, are almost always compound in the direction of the mouth; but when the ramus, coronoid process, or condyle are fractured, the

Fig. 1.

bone is too deeply seated for the injury to extend into the mouth, unless caused by a gunshot or missile.

Fig. 1 represents a compound fracture of the lower jaw, the line of fracture extending through the body of the bone as follows: First, to the left of the symphysis, between the central and lateral incisors; second, between the cuspid and first bicuspid; third, back of the last molar. This variety is usually caused by a blow on the side of the face, and is exceedingly difficult to reduce and retain in position while introducing the splint.

Teeth that are loose or fractured should not, as a rule, be extracted, for in time they often become firm and useful. Those with the pulp exposed ought, if possible, to be removed or the pulp destroyed, otherwise their presence will cause unnecessary pain.

The fundamental principles inculcated by Drs. Gunning and Bean (dentists), of taking impressions of both jaws and reconstructing the model of the fractured jaw by articulating the teeth to the cast of the unbroken jaw, and making with vulcanite a splint on the reconstructed model, has been adopted.

Any attempt to reduce the fracture previous to taking the impression will inflict needless pain, as it is impossible, as a rule, to bring the fragments into perfect apposition and retain them while an impression is being taken; nor is it desirable, as this can be accomplished when readjusting the plaster model.

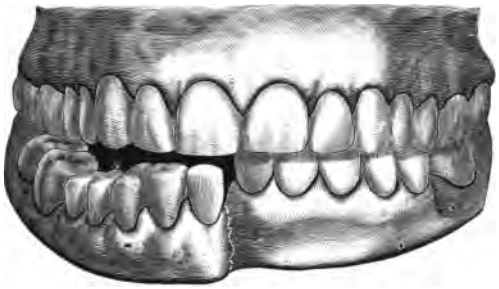


Fig. 2.

Before taking an impression of the fractured jaw, remove any tartar about the teeth, for the better adaptation of the splint as well as of ligatures, if the latter should be required. Impressions of both upper and lower jaws will be required; for this purpose there is no material so suitable as plaster of paris; modelling composition, however, may be employed for the uninjured jaw.

Obtain an impression of the uninjured jaw first, thus gaining the confidence of the patient. The impression of the fractured jaw should include the entire jaw and all the teeth; where this is not possible, take a special impression of the displaced fragments. After obtaining both impressions, make a careful examination of the fractured jaw, to ascertain, if possible, the pressure required to replace the fragments in their normal position and to hold them there. The displaced fragments, as shown in the cast, must then be separated; next, accurately articulated to the upper teeth and the fragments cemented in proper position with plaster of paris.

Fig. 2 represents a fracture at the symphysis. Fig. 3 represents the displaced fragment sawed from the cast (Fig. 4.)

The occluding or grinding surfaces of antagonistic teeth are

unmistakable, and there is no excuse for making an error in resetting the plaster model. Should any discrepancy occur, it will be fatal to the success of the appliance. In all cases where there are teeth which occluded with those of the opposite jaw (previous to the fracture) a mistake is impossible, if care be exercised.

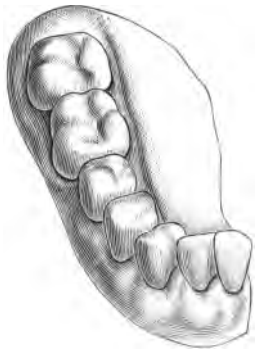


Fig. 3.

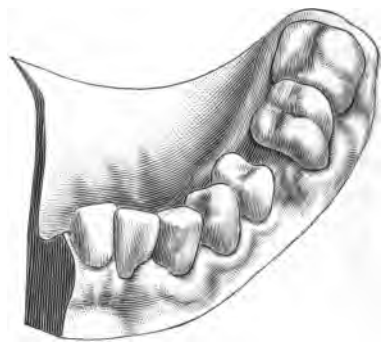


Fig. 4.

Fig. 5 shows the plaster fragments placed in their normal position and cemented together, ready for the articulator.

In fractures where the teeth are missing, take an impression of the alveolar ridge in the same manner as for artificial teeth, and there will be no difficulty in correcting the model. The splint should be molded with wax on the reconstructed plaster cast, and must

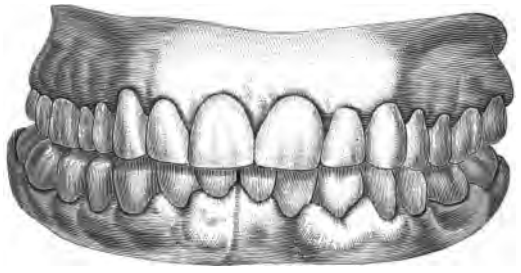


Fig. 5.

embrace each fragment of the jaw. If to be used for mastication the splint should cover all the teeth.

After modelling the splint in wax, and just before removing the cast for flasking, soften the wax with dry heat. (The grinding surface of the teeth should have been previously oiled to prevent their adhering.) Then close the articulator, forcing the grinding-surface of the upper teeth into the wax, thus giving a uniform grinding-surface. Before packing the rubber, cover the teeth and

model with two or three thicknesses of tin foil. There are two reasons for doing this: first, it makes the splint a trifle larger; second, it gives a clean surface. After vulcanizing, immerse the splint in diluted muriatic acid to dissolve the tin. Interdental splints ought to be so adjusted that mastication can be performed.

In many fractures of the lower jaw it will be impossible to hold the fragments in the splint, in their normal relations, by merely attaching them to the splint. In these cases the appliance must be supplemented by an external metal compress, so attached to it that the jaw will be held as in a vise. The tightening of this compress forces the fragments into the splint and securely holds them.

Fractures of the upper jaw require but little treatment compared with those of the lower, since the bones are naturally immovable, and there is little difficulty in keeping the fragments in position.

The length of time necessary for wearing an interdental splint is variable; the shortest time, however, being about three weeks.

Brief histories of the following cases are furnished as illustrating the different methods and appliances used by me in the treatment of fractures of the maxillary bones.

Case 1.—Male, aged fifty. Treated at Bellevue Hospital, 1870. Lower jaw fractured on the left side, the line extending through the body between the cuspid and first bicuspid. The displacement of the posterior fragment was downward and outward. No displacement of the right side.

The splint used for this patient was made of vulcanite, covering all the teeth, and held in position by first tying ligatures to the teeth and afterward to the splint. The holes on the grinding-surface were for two purposes: first, to ascertain if the teeth were in proper position; second, to introduce the nozzle of the syringe for cleansing. After reducing the fracture and adjusting the splint the patient was enabled to masticate without any difficulty. The splint was worn about four weeks, and on its removal occlusion of the teeth was found to be correct.

Case 2.—Male, aged thirty-five. Treated in Bellevue Hospital, 1870. Lower jaw fractured in two places; on the right side between the lateral incisor and cuspid, and on the left of the symphysis, between the central and lateral incisors. Two incisors on the right side and one on the left side had been knocked out at the

time of the injury. The anterior fragment was forced back and downward under the tongue; the left side of jaw displaced downward and inward. (See Fig. 6.)

A splint similar to the one just described was applied, except that after inserting the splint and reducing the fracture a chin-piece

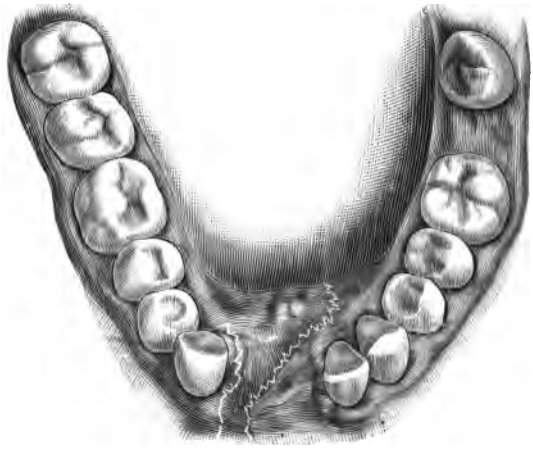


Fig. 6.

of gutta-percha (the impression-material now used by dentists is much better,) padded with cotton, held in position with a four-tailed bandage, was added. Nourishment was taken through a space left in the splint. (See Fig. 7.)

Fig. 7

After a few days it became necessary to remove the chin-piece, as the patient complained of soreness and pain. It was then discovered that an abscess had formed on the left side of the symphysis. This, on being opened and probed, was found to contain a small piece of bone, which was removed. The parts were cleansed with a solution of carbolic acid and glycerine, the cotton padding

renewed, and the chin-piece reapplied. This was frequently removed for renewing the cotton and for treatment of the abscess, which healed in a few days. About this time a second abscess formed under the splint, near the symphysis. This, on being opened, contained a piece of alveolar process, which was removed. Later several other pieces of alveolar process presented themselves at or near this opening, and were removed. At the end of three weeks the union of the fragments was sufficiently firm to permit of the removal of the chin-piece, allowing the use of the jaw for mastication. The bandage, however, was retained, except when nourishment was being taken. The splint was removed after being worn about six weeks, when occlusion of the teeth was found to be correct.

Case 3.—The patient, a miner, aged twenty-seven, was admitted to Bellevue Hospital May 2, 1872. Three days before admission he was injured by a splinter of wood from an explosion of nitro-glycerine. Examination revealed a compound comminuted fracture of right half of inferior maxilla. There were three points of fracture: first, between the left lateral incisor and the cuspid; second, between the bicuspids; third, at or near the angle of the jaw; considerable displacement of all the fragments.

The anterior fragment, containing three incisors, the cuspid, and first bicuspid, was depressed half an inch and displaced backward. The middle fragment, including the second bicuspid and three molars, was carried up nearly to the median line and slightly backward. The posterior fragment was slightly elevated.

A splinter of wood about a half-inch long had been extracted from an external wound which extended inward from the symphysis for an inch and a half along the line of the jaw. A clot of blood occupied the left side of the floor of the mouth; there was also considerable swelling about the face. The patient swallowed with difficulty, fluids escaping through the nose; articulation very indistinct.

Large fragment of the jaw, containing one bicuspid and two molars, became detached The third molar also came away, together with a piece of granite about the size of a pea (Fig. 8.) Treatment up to this time consisted of disinfecting the mouth with a solution of carbolic acid and glycerine.

The wound was also dressed with the same, and the jaw supported with a four-tailed bandage.

Impressions were taken in plaster of paris preparatory to making an interdental splint (Fig. 9). This was constructed similar to those already described, with the addition of two steel wires (old excavators) vulcanized in the splint and curved upward

Fig. 8.

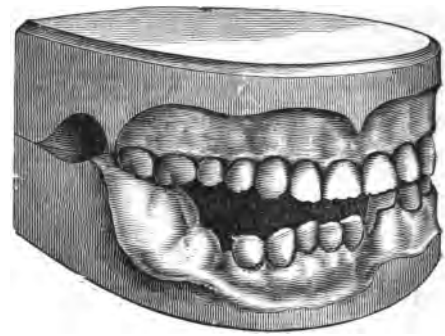


Fig. 9.

as they emerged from the corners of the mouth, thus avoiding pressure on the lip, and extending backward nearly to the angle of the jaw (Fig. 10.) A rubber band was substituted for the bandage, and extended from one steel wire under the jaw to the other, outside of the gutta-percha chin-piece. Interdental splint adjusted

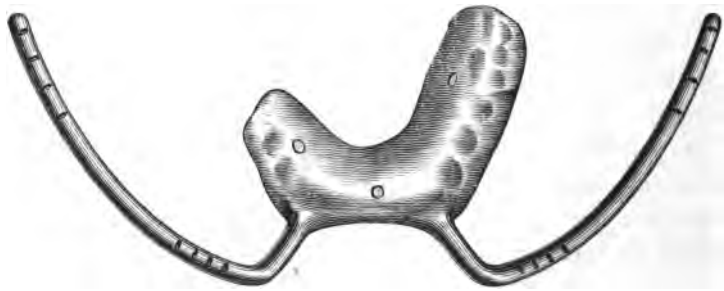


Fig. 10.

Fig. 11.) Patient removed this five hours later, on account of considerable pain on the right side of the symphysis.

During a period of ten days after the readjustment of the appliance, it was found necessary to occasionally remove the chin-piece for some hours, owing to extreme pain and tenderness of the external surface. Cotton and a bandage were temporarily substituted for the chin-piece and rubber band. Both pain and tender-

ness were partly caused by the pressure requisite to retain the fragments and splint in position. The splint was constantly worn, except at such times as were necessary to remove it for cleansing. After two months, firm union was found to have taken place, and occlusion of the teeth correct.

Case 4—Male, aged about sixty. Admitted to Bellevue Hospital, 1870. Lower jaw fractured on the right side, between the bicuspids. Previous to admission to hospital he had been treated with gutta-percha covering the teeth, and a four-tailed bandage. About four weeks after the accident these were removed, as union

Fig. 11.

had taken place, but upon examination all the teeth to the left of the fracture, back to the wisdom-tooth, were found to be displaced downward from one-half to one-fourth of an inch (Fig. 12.)

Impressions were taken, and a splint made similar to that described in Case 3. The patient was etherized and the jaw refractured at the same point. The splint was adjusted and held in position as in Case 3. About twenty-four hours after the adjustment of the appliance, the patient complained of numbness extending from the point of fracture to the symphysis. On examination, after the removal of the chin-piece, it was thought that the numbness was due to an injury of the nerve at or near the mental foramen. It remained for some weeks, but eventually normal sensation was regained.

The splint was worn with comfort for six weeks, the chin-piece being occasionally removed for the purpose of cleansing. Occlusion of teeth was found correct at this time.

Case 5.—Male, aged thirty. Treated at Bellevue Hospital, 1872. Lower jaw fractured at the symphysis. The left central incisor, being loose, was removed. The right fragment was displaced downward and inward; the left inward.

The splint used in this case was similar to the one last described, except that for the steel wire, gutta-percha chin-piece, and rubber band, an external metal compress was substituted. This was constructed from a saw-frame such as is used by mechanical dentists (Fig. 13). To this was attached a revolving brass chin-

Fig. 12.

piece (Figs. 14, 15); this was padded with spongio-piline covered with oiled silk (Fig. 16). The splint was worn four weeks, when occlusion of the teeth was found to be correct.

This external metal compress was found to be similar in its construction, more readily applied, and more effective. The chin-piece should be made of any size or form the case may require. If there are external wounds or abscesses, holes should be cut in the chin-piece corresponding with these, thus permitting drainage and treatment.

For the reduction or retention of any fracture of the lower jaw with much displacement, and where external pressure is required, this form of splint will prove as effective as any appliance that may be employed. When used, it is not always necessary to completely reduce the fracture at the time of introduction. The use of the jaw for masticating will gradually cause a proper adjustment of the teeth to the splint.

Case 6.—Male, aged about forty. Lower jaw fractured at the

symphysis. Left side displaced downward about one-fourth of an inch and carried inward. Appliance similar to that last described. Fracture reduced without any difficulty. After wearing the splint four weeks, occlusion of the teeth was found to be normal.

Case 7.—Male, fifty-two years of age; while assisting in launching a ship, March 1, 1873, was struck by a heavy bar across the left side of the face. Admitted as a patient to Bellevue Hospital.

Examination revealed a lacerated wound an inch long, situated three-quarters of an inch above the right angle of the mouth. The lower jaw was fractured in three places; first, at the end of the spmphysis, between the central and lateral incisors; second, at the

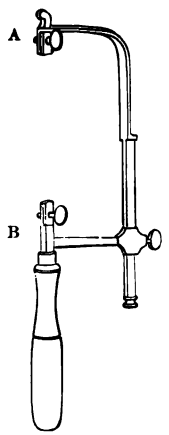


Fig. 13.—The handle and the parts marked A, B, were removed.

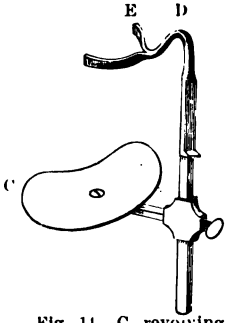


Fig. 14.—C, revolving brass chin-piece. The rod at D, the point of contact with the lips, is made round to avoid irritation, and at E is split and bent to nearly conform to the contour of the jaw and teeth. To this (E) is attached the vulcanite.

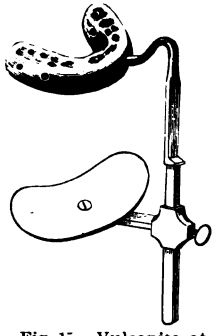


Fig. 15.—Vulcanite attached. The top holes serve for ascertaining if splint and fragment are in position; the side holes are for cleansing.

right of the symphysis, between the central and lateral incisors; third, at the angle back of the last molars, right side. The anterior fragment was displaced downward and backward, and the large fragment on the right, containing six teeth, was depressed at the anterior end, much elevated at the posterior. No displacement of the left side of the jaw.

The wound in the lip was closed with silk sutures, and a four-tailed bandage applied to the jaw, but a few days' trial proved its inefficiency. Impressions were then taken for an interdental splint. Upon removing impression of the upper jaw, this also was found to be fractured as follows: first, from behind the second bicuspid on the right side across the roof of the mouth, through the alveolar process on the left side, where the first molar had been extracted,

then around in front, above the teeth, to the right side; second, between the central and lateral incisors of the right side, running along the median line and intersecting the fracture before described (Fig. 17). The two fragments containing all the teeth anterior to

Fig. 16.—Appliance in position.

the molars were slightly displaced. These fractures were readily readjusted and held with ligatures.

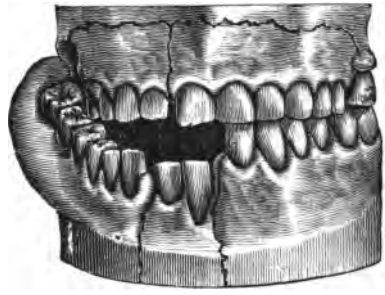


Fig. 17.

For the lower jaw the splint similar to that used for Case 5 was applied March 9, with the exception that the tongue-holder or duct-compressor (used by dentists) was substituted for the saw-frame; the chin-piece padded with spongio-piline covered with oiled

silk. From that date the patient experienced no discomfort, and ate the ordinary hospital food without difficulty (Figs. 18, 19). On March 20 he was discharged from the hospital, and on April 10 the splint was removed. No deformity remained.

Fig. 18.

This case appears in Dr. N. W. Kingsley's article published in Johnston's Miscellany, February, 1874, also in his work on Oral Deformities, pages 405, 406, and 407. I quote the following from

Fig. 19.—Appliance in position (from photograph of patient).

Johnston's Miscellany: "The impressions, cast and adaptation of this instrument were made by my assistants, Messrs. Gibson and W. H. Kingsley."

The duct-compressor had been previously used by me as a part of an interdental splint in a number of cases.

Case 8.—1875. Patient, a policeman, aged thirty-five. Lower jaw fractured on right side, between second bicuspids and second molar; the first molar having been extracted, third molar missing. An attempt had been made to reduce and hold the fracture by covering the teeth with gutta-percha and supporting the jaw with a four-tailed bandage.

Twenty days after the injury was received, on taking impressions for an interdental splint, it was discovered that there was no actual displacement of the anterior fragment, but the posterior one, including the second molar, was elevated about three-fourths of an

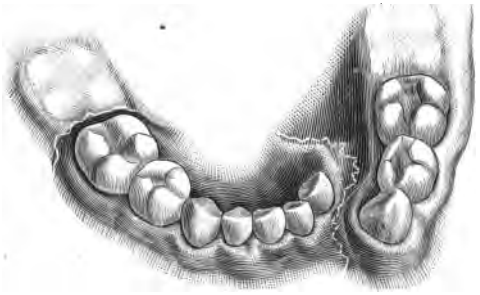


Fig 20.

Fig. 21.

inch, the tooth coming in contact with the third molar on the upper jaw. The treatment was similar to that used in Case 7, and the fracture was reduced without any difficulty. The splint was worn with comfort for thirty days. On removal the teeth occluded correctly.

Case 9.—1878. Male, aged about twenty-five, subject to epileptic convulsions. Fracture due to a fall during one of these attacks. The lower jaw was fractured at the symphysis; right side displaced downward about one-fourth of an inch; anterior end of fragment outward; posterior portion of jaw inward about one-fourth of an inch. No displacement of left side of the jaw. (See Fig. 2.) An attempt had been made to reduce and hold the fragments in position with gutta-percha covering the teeth, and a four-tailed bandage.

Two weeks after the accident impressions were taken for an interdental splint, which was applied April 3. The fracture was reduced without any difficulty. The splint was worn with comfort, and on May 9 it was removed, occulation of the teeth being cor-

rect. A few minutes after the removal of the splint the patient had an epileptic seizure, although he had been free from these attacks during the treatment for fracture. Appliance similar to Case 8.

Case 10.—Patient, a boy, aged six. Two fractures of the lower jaw. First, between the lateral incisor and cuspid, left side; second, back of last temporary molar on right side. Displacement of anterior fragment downward and inward, each about one-fourth of an inch; slight displacement of posterior fragment; no displacement of left side (Fig. 20). The splint used was similar to the one in Case 7, with necessary alterations Fig. 21). This will be more fully explained at the end of the article, in the description of the splint adopted for all cases where an external metal compress is required.

Attempts had been made to reduce and hold the fragment, first, with ligatures about the teeth; second, with gutta-percha covering the teeth and a bandage, neither of which proved effectual.

Three weeks after the accident, August 22, 1878, an interdental splint was adjusted. Great difficulty was encountered in reducing this fracture. A few days later, the reduction not being satisfactory, the splint was removed, nitrous oxide administered, fracture reduced, and splint replaced. The splint was worn about five weeks. On removal, the anterior fragment was found to be slightly displaced downward and inward.

Case 11.—1878. Male, aged fifty. Lower jaw fractured on right side, between the cuspid and first bicuspid; the left side displaced downward about one-fourth of an inch.

Appliance similar to Case 8. Fracture reduced without any difficulty. The splint was worn about four weeks. On removal, occulation of the teeth was found correct.

Case 12.—Patient, male, aged forty-seven. Three fractures of the lower jaw; first, at the symphysis, left lateral incisor knocked out at time of injury; second, at the left side back of second molar, third molar having been extracted several years before; third, at neck of the condyle.

Displacement of anterior end of the anterior fragment downward and inward about one-fourth of an inch. The posterior end was carried outward about one-fourth of an inch at last molar. Very little displacement of the posterior fragment. Displacement of the fragment at neck of the condyle outward. Right side of the

jaw not displaced. Several attempts had been made to reduce and hold the fragments in their normal position.

Three weeks after the accident, impressions were taken for an interdental splint. Two days previous to this two external abscesses were opened—one on a line with the second molar, and under the jaw, the other about half an inch in front of lobe of the ear on left side. Pieces of bone were removed from these. The splint was similar to the one used in Case 8.

An impression of the entire external surface of the lower jaw was taken. Dies were cast in zinc and lead, and a chin-piece swaged out of brass, which extended from the angle of the jaw on the right side around underneath the chin to the left side, including the three fractures (Fig. 22). Pieces were cut out of the chin-piece at A A, opposite the abscesses, for drainage and treatment.

Fig. 22.

Fig. 23.

The patient was etherized, the fracture reduced with great difficulty, and the splint adjusted. The fragment near the condyle was held in place by a thumb-screw set in the chin-piece at B, opposite the point of fracture. To this was attached a hard rubber pad about the size of a twenty-five-cent piece, to reduce and hold it. For days after the application of the splint the patient suffered severe pain. The chin-piece was occasionally removed for the purpose of cleansing and repadding. At the end of six weeks the splint was removed, union having taken place with a slight displacement downward and inward at the symphysis.

Case 13.—Male, aged thirty-six; accident due to a fall. Lower jaw fractured on right side between lateral incisor and cuspid. Displacement on right side outward about one-fourth of an inch at point of fracture. No displacement of left side.

Twelve days after the accident, impressions were taken for an interdental splint. This was made of vulcanite, fitting the lingual

surface of the teeth, extending downward about one-fourth of an inch below the necks (Fig. 23).

On the left side the first bicuspid and second molar were missing. A gold clasp was made fitting the posterior and lingual surfaces of the second bicuspid. Gold wire was vulcanized in the splint, fitting the lingual surface of the cuspid on the left side, and extending along the buccal surface of the cuspid and incisor to a point nearly corresponding to the fracture, and then bent to form a hook. On the right side gold wire of the same size was vulcanized in the splint at the lingual surface and around the posterior surface of the second molar (third molar missing), and extending along the buccal surface of the molars and bicuspids, terminating in a hook within one-fourth of an inch of the hook on the left side.

Ligatures were passed through two holes in the splint opposite the necks of the first and second bicuspids respectively, and tied. The splint was then introduced, the fracture reduced, and ligatures from the plate tied around the first and second bicuspids. The splint was accurately held in place on the left side by the clasp around the second bicuspid. A ligature was tied in the hook on the left side and caught in the other hook and tied, thus bringing the two hooks nearly together.

The patient had no difficulty in masticating after introduction of the splint. About ten days after adjustment an abscess which caused much pain appeared under the chin, to the right of the symphysis. On opening the abscess there was a free discharge of pus, and on probing a small piece of bone was found. A second abscess appeared a few days later near the point of fracture, below the laterial incisor. On opening a piece of alveolar process was found. Both abscesses healed in a few days. The splint was worn six weeks, at which time the occlusion of the teeth was correct.

Case 14.—1873. Female, aged seventy. Lower jaw fractured on the right side, at a point corresponding with the cuspid. Displacement of posterior fracture downward and inward; had worn a full set of upper teeth, also a lower set, on gold, for twenty-five years.

Three days after the accident the six front teeth were removed from the upper plate and the two plates united by gold wires soldered to the plates at points corresponding with the cuspids.

The plates were adjusted to the mouth, the fracture reduced

and held in place with a four-tailed bandage. Nourishment was taken through an opening formed by removal of the teeth. Four weeks after, union having taken place, the plates were removed and the teeth replaced in position and soldered.

Case 15.—Lower jaw fractured on the right side, between the cuspid and first bicuspid. Displacement of left side of the jaw outward; none on the right side. The normal occlusion of the jaws showed that the incisors and cuspids of the lower jaw shut outside of those on the upper jaw (Fig. 24).

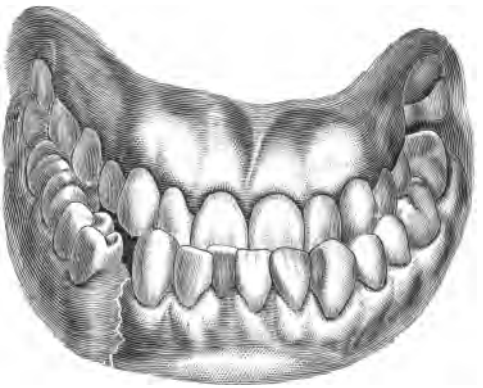


Fig. 24.

The splint of iridium wire was constructed so as to fit the buccal and lingual surfaces of all the teeth at the necks, and the ends joined by soldering. On the right side wire of the same size was soldered, extending from the buccal to the lingual surface, over the grinding-surface between the cuspid and first bicuspid. Similar wires were attached between the first and second and second and third molars; and on the left side between the cuspid and first bicuspid, first and second molars. The last molar was missing. The object of these wires was to prevent the splint from working down into the gum and causing irritation, loosening, and elongation of the teeth (Fig. 25).

To hold the splint in position strong linen thread was tied around all the bicuspids and molars, and the thread in turn fastened to the buccal and lingual surfaces of the splint. Small platinum or silver wire may be used instead of the thread.

In this form of splint advantage should be taken of any space between antagonistic teeth, in adjusting the wires, passing them

from the buccal to the lingual surface. Should the wires interfere with occlusion, all the teeth and the splint must be covered with gutta-percha.

Case 16.—Fracture of lower jaw, right side, between second and last molars; displacement of posterior fragment upward about one-fourth of an inch. Appliance similar to the one used in Case 15.

A hook, made of the same sized wire as the splint, was soldered to the buccal surface of the splint opposite the last molar. The corresponding tooth on the upper jaw was missing. The hook was to reduce and retain the fragment. The splint was held in position with ligatures (Figs. 26, 27).

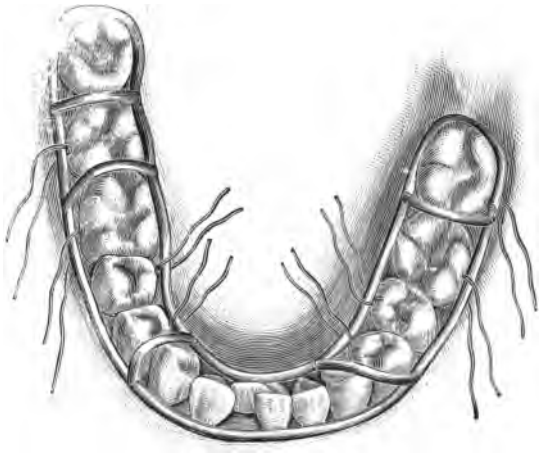


Fig. 25.

Case 17.—Fracture of lower jaw, right side, back of first molar; second and last molars missing. Posterior fragment elevated about one-fourth of an inch. Splint similar to the one previously described, with the addition of rubber vulcanized to cover the jaw where teeth had been extracted. This rubber extended down about one-eighth of an inch on the buccal and lingual surfaces (Figs. 28, 29).

Case 18.—Fracture of lower jaw, right side, back of third molar. Posterior fragment elevated about one-fourth of an inch Splint similar to the one used in Case 15, with the addition of an iridium wire spike soldered on the end of the splint back of the last molar. The spike (of the same length as elevation of the fragment)

was forced through the tissue to the bone, reducing and holding the fragment (Figs. 30, 31).

Case 19.—Bellevue Hospital, September 1, 1871. Boy, aged nine, kicked by a horse. Nasal bones fractured and removed.

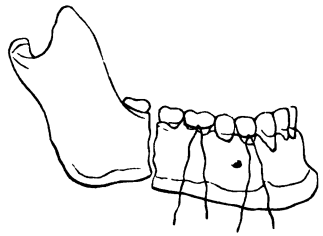


Fig. 26.

Fig. 27.

Upper jaw separated at median line. Left side forced backward and downward in the pharynx. Quills were placed in the nostrils to enable the patient to breathe. The upper jaw contained only

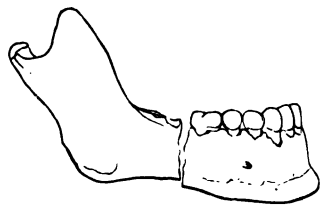
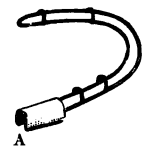


Fig. 28.



A

Fig. 29.—A, vulcanite attachment.

six permanent teeth,—four incisors and two sixth-year molars,—badly decayed, with some roots of temporary molars.

The splint was made of rubber, covering the roof of the mouth, including the sixth-year molars and roots of the temporary teeth, extending up to and fitting the lingual surface of the incisors. Two

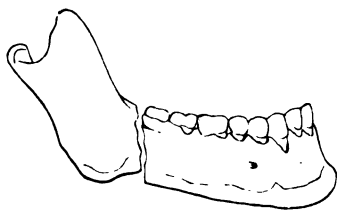
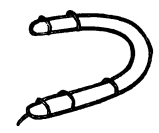


Fig. 30.



A

Fig. 31.—A, spike.

steel wires (old excavators), vulcanized in the splint, emerged obliquely from the corners of the mouth for about one-half an inch, then bent backward to about one-half an inch in front of the lobe of the ear, then curved downward and outward (Fig. 32).

The splint was introduced and the fracture reduced. A bandage extending from the steel wire on the left, over the head, around the wire on the right side, back over the head to the left wire again, held the splint in position. A second bandage passed around the head, and was pinned to both sides of the bandage from the wire. The two incisors on the left side were of great assistance in holding the fragments in their normal position. On the day after adjustment of the splint, the patient was removed by his parents from the hospital. Twenty days later the splint was removed by a physician, and after three days more had elapsed the fragments were found to have united without any displacement.

The following form of appliance has been adopted as best meeting the requirements of cases needing an external metal compress (Fig. 33). It consists of three parts: first, a compressor;

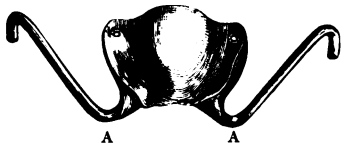


Fig. 32.—A, A, Steel wires.

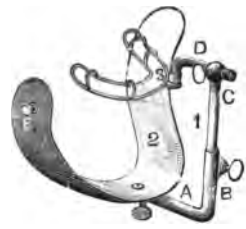


Fig. 33.

second, a chin-piece; third, an inner steel band or the wire splint described in Case 15 (Fig. 25).

First. The compressor (used without alteration for all cases), consisting of a horizontal rod (A) and a vertical rod (B), each about two inches in length, meeting at right angles. Rod B is hollow, and at its upper end is fitted a thumb-screw so adjusted as to hold at any point in it a movable rod (C), thus regulating pressure. Passing horizontally through a bulb at top of rod C is a rod (D) three inches in length, bent downward at right angles for about an inch. One-half of this lower end is smaller in diameter than the other half, leaving a shoulder. A thumb-screw in the bulb admits of the adjustment of rod D at any angle.

Second. The chin-piece is attached to the compressor by a thumb-screw, so adjusted that it may be pushed backward and forward on the rod A, and at the same time affording a double rotary movement. The chin-piece is made in different forms, each peculiarly adapted to the location of fracture. (a) If fracture is at or

near the symphysis, the chin-piece consists simply of a flat piece of brass placed directly under the chin; (b) if back of the cuspid teeth involving the molars, it should fit the chin extending back to the angle of the jaw; (c) if involving both the angle and the condyle, it must include the entire lower jaw, and extend to the line of the ear. A metal button (E) should be attached on each side of the chin-piece for use in attaching any necessary support. For support nothing surpasses a skull-cap, to each side of which can be attached a piece of elastic reaching to the chin-piece; this in turn can be fastened to the metal button by a ring sewed in the end of the elastic.

Third. The inner steel bands are made of various sizes and shapes to conform as nearly as possible to the contour of the jaw and teeth, and are vulcanized in the splint.

In using the wire splint described in Case 15, attachment to rod D is obtained by a socket soldered in the splint at the median line. As a rule, the wire splint gives sufficient strength to allow of gutta-percha being substituted for vulcanite.

This appliance has been so constructed that the external compress may be removed independent of the splint proper; temporarily where external wounds or abscesses need treatment; permanently where there is sufficient union to retain fragments.

Any irritation of the lips caused by the adjustment of the rod at the median line may be remedied by removing (the patient having previously closed the jaws firmly) the external compress and readjusting it at any point to the right or left.

MISCELLANEOUS.

THE CARE OF THE VULCANIZER.

DR. GEORGE B. SNOW.

Dental Advertiser.

Vulcanizers are gradually weakened and eventually destroyed by erosion. To illustrate this, a condemned boiler was cut longitudenally through. The original thickness of the metal was fully preserved at the bottom and but slight deficiency at the top. The action had been almost wholly on the sides; at the middle the metal had wasted away until it was scarcely thicker than heavy paper. Still this vulcanizer was used until it had reached this state of deterioration, without giving way. This shows how little strength is really required to withstand the pressure due to the vulcanizing temperature, if care is taken that it be not exceeded.

When the sides of the vulcanizer are weakened by corrosion to any great extent, the fact is easily ascertained by tapping them lightly with a small hammer. If the metal is thick and strong, it will be elastic, and the hammer will rebound from a light blow, though of course copper would yield to a heavy one. When the metal is quite thin, the sensation will be as though the blow were delivered upon lead. There will be little if any rebound, and the metal will be driven in and dented by a very light blow.

Corrosion occurs to a certain extent from exposure of the vulcanizer to air and moisture. Indeed, it is by no means sure that the greater part of it does not thus take place. It is good practice to clean the vulcanizer pot, and wipe it dry before laying it away after use.

Another cause of failure in vulcanizers, one which happily occurs but seldom, is the cracking of the metal near the corner of the bottom. As the bottom is usually covered with scale, it may crack and even give way before the existence of any defect is suspected. This fact forms another argument for keeping the vulcanizer clean, as before mentioned.

When a screw fastening like that of the Whitney vulcanizer is

employed, mischief is often done by the inordinate use of black-lead or soap-stone powder upon the packing joint, and incidentally upon the screw. The particles of which either of these powders are composed, are hard enough to wear away metal if placed between two rubbing surfaces, and in consequence the screw threads of vulcanizers are sometimes so worn that they have not sufficient hold upon each other to retain the cover; which on some fine day mounts to the ceiling, and disappears in the lath and plaster, much to the surprise and disgust of the owner.

The reason for applying soap-stone or plumbago powder to the surface of the packing seems, in many cases, to be entirely misapprehended. Its only office is to prevent the packing from sticking to the edge of the pot. A minute quantity only is required for this purpose, and its application need be made but seldom. If it is applied too liberally or too often, it will form a thick coating on the surface of the packing, which will be porous and will be the cause of leakage. When the coating attains any great thickness, it will scale off; and the leakage, which may have been almost imperceptible before, will now be increased to such an extent as to be annoying. Possibly the dentist does not detect the cause of the trouble, and, thinking that the vulcanizer works hard, applies oil to the thread. This is burnt by the heat of vulcanizing, and the cover is virtually cemented to the pot. It is now removed with difficulty, if at all. As a rule, when the packing of a vulcanizer is in good order and steam-tight, the less that is done to it the better.

There is another matter connected with the management of the vulcanizer, which frequently causes great annoyance, if not properly understood. If the vulcanizer is too full of water, not allowing adequate room for its expansion when heated, a pressure will be developed much greater than that due to the production of steam. The safety disk will in this instance be blown out, possibly at as low a temperature as 280° or 300°. Or if the safety apparatus be put out of order, the vulcanizer pot may be bulged and stretched out of shape, or a rupture may be the result, and a so-called explosion ensue.

It must be remembered that water is inelastic, and that when it is confined, with inadequate room for its expansion, the resulting force is practically irresistible. It is an easy matter, if the vulcan-

izer be wholly filled with water, to obtain a pressure of six, eight, or nine hundred pounds to the square inch, without heating the water to the boiling point. Is it any wonder that they sometimes give way when carelessly used?

A safe rule is to allow one-sixth at least, better one-fourth, of the capacity of the vulcanizer for steam room. The user of a vulcanizer should never lose sight of the fact that it is a steam boiler, and is subject to deterioration by use. The rules for its management should be thoroughly read till clearly understood, and carefully observed, and after the vulcanizer has been in use for a time it should be inspected frequently, and any signs of weakness carefully noted.

HOW GOLD FOIL IS MADE.

British Journal Dental Science.

Gold foil is manufactured as follows: Chemically pure gold is fused in a new borax-lined crucible and cast into flat oblong ingots. The ingot is formed into a ribbon by repeatedly pressing it through the rolling mills until it is about .80 inch thick. The riband of gold is annealed and cut into pieces of about one square inch in size and weighing usually 5 grains each, though some heavy foils are made of 40 grains to the sheet.

Each piece is with a pair of wooden forceps placed upon a leaf of toned paper of peculiar make. When a sufficiently deep pile (technically 'catch') of the alternate gold and paper has been formed, a parchment case, open at both ends, is drawn over it, and this is enclosed in a second similar case so as to cover the edges left exposed by the first case.

The packet is then beaten with a shorthanded sixteen-pound hammer upon a smooth block of marble strongly supported from below and surrounded on three sides by a wooden ledge. The front edge is open and has a leathern apron attached to it, so as to catch any fragments of gold that may escape. Every now an again the beater turns the packet over and bends it to and fro to overcome any slight adhesion there may be between the gold and the paper. The beating is continued until the one inch squares are spread into $3\frac{1}{2}$ inch squares, nearly the size of the paper. The gold

is then placed in a similar packet called a shoder, larger than the first, and beaten again. If the packet is unduly beaten in the centre the leaves crack round the edges, but on beating, so as to spread the edges the cohesiveness of the gold causes the leaf to unite again.

The packet is opened and the leaves spread by wooden forceps, assisted by blowing with the mouth, upon a leathern cushion, where they are cut to one size by a sharp-edged square molding of cane. The leaves are then annealed, preferably upon a sheet of talc or platinum gauze in a muffle and packed in books ready for sale as cohesive gold.

MAKE YOUR OWN HEATING GAS.

A. W. DAVISSON.

Items of Interest.

It can be constructed at a cost of not exceeding two dollars for materials and the production of gas at a mere trifle of expense.

Make a small bellows, which forces air through a rubber tube to the bottom of a two-quart kerosene can, to the spout of which can is a rubber tube leading to a small gasometer, made of tin, varnished inside and out with asphaltum varnish. From this is a tube to a wash bottle, and from this is a tube to a bunsen burner.

Put about a quart of gasoline in the kerosene can or generator, work the bellows which forces air through the gasoline into the gasometer, where it awaits your pleasure in the form of a gas which is nearly equal to that servant which our city brother is so fortunate as to possess.

COPPER AMALGAM—TO MAKE.

Western Dental Journal.

To one oz. (troy) of pulverized sulphate of copper add eight fluid ozs. of warm water. This dissolves the salt promptly. A piece of thick bar iron, previously brightened by being placed in a pickle bath, should now be immersed in the solution. The forma-

tion of solution of sulphate of iron and the precipitation of copper in fine pulp commences immediately. This process continues for several hours and the copper pulp should occasionally be scraped off the iron plate into the solution with a piece of stick; when no more copper precipitates, the iron plate should be taken out and cleaned for future use.

The supernatent solution is of a yellowish green color, and when it is reasonably cleared by the settling of the precipitate, it should be carefully poured off; sufficient pickle is now poured upon the precipitate, and this is frequently stirred with a glass rod. This is for the purpose of cleaning and purifying the copper pulp, and should be done at intervals for several hours until no bubbles rise from the agitation. When sufficiently pickled, the acid-water is poured off, and the soft pulpy residium is put into a glass or wedgewood mortar, to which is added one oz. of mercury. The whole is then rubbed up with a pestle, and prompt and complete amalgamation ensues. After the amalgam is made it is washed repeatedly. The mass is now squeezed gently through a chamois skin and the half-squeezed mass is thoroughly triturated in the mortar. It is then squeezed hard and is again tritured, divided into small portions, and is either packed into molds or squeezed into wafers and allowed to harden. This takes from 12 to 24 hours, and the amalgam is then ready for use and in the form in which we obtain it from the depots.

WORKING STEEL.

DR. T. FILLEBROWN.

Items of Interest.

Very often an instrument of peculiar form is needed for a special case. It is, therefore, very important that every operator should be able to make such instruments as necessity requires, and the following directions will enable him to do so:

A worn excavator is the ever-ready material for this purpose. Heat to a cherry red, and hammer it on the anvil toward the form desired only as long as it will yield easily. Repeat the heating and hammering till the desired form is obtained. Heating hotter than a cherry red or hammering when cool injures the steel. Bend

the point to the form desired and reduce to proper size; form the edge by filing and grinding. Smooth and polish with emery, stone, pumice and rouge; the instrument is then ready for the process of hardening and tempering.

To obtain the proper temper for a good cutting edge, the instrument must first be heated to a bright red heat, and suddenly cooled by plunging into cold water or other cold liquid. This will give to the steel a silvery whiteness, and render it so hard that a sharp corner will easily scratch glass; this should be the test of the hardening. Make the part to be tempered clean and bright with fine emery or by other means; heat the instrument slowly, well up on the shank, and allow the heat gradually to approach the point; the blue and straw colors will be seen to run down on the shank as the heat progresses. There will be all the shades of blue, from very dark to very light, and joined to this a dark straw color, which will terminate in a very light straw.

The dark blue represents a soft steel; the medium and light blue a spring temper; the dark straw shows a soft cutting edge, and the pale straw a very hard cutting edge.

A thick edge will bear a much harder temper without breaking than a thin edge, consequently the thick edge may be left a very pale straw, while the thin edge must be a little darker.

For drawing the temper of small instruments, the flame of the annealing lamp is sufficient. For hardening, a greater heat is required.

The shank of the instrument should be of spring temper, and some practice will be necessary to obtain a good spring temper throughout the length of the shank, and avoid reducing it too low in some places.

A weak solution of sulphuric acid will, in a few moments, remove from the instrument all of the coloring caused by tempering.

WINCHELL'S PASTE.

Popular Science News.

Professor Alex. Winchell's cement will stick on anything. The recipe is as follows: Take 2 ounces of clear gum arabic, 1½ ounces of fine starch and ½ ounce of white sugar. Pulverize the

gum arabic, and dissolve it in as much water as the laundress would use for the quantity of starch indicated. Dissolve the starch and sugar in the gum solution. Then cook the mixture in a vessel suspended in boiling water, until the starch becomes clear. The cement should be as thick as tar, and kept so. It can be kept from spoiling by dropping in a lump of camphor, or a little oil of cloves or sassafras. This cement is very strong indeed, and will stick perfectly to glazed surfaces, and is good to repair broken rocks, minerals, or fossils.

TRUEMAN'S ALLOY.

Dental Cosmos.

Pure silver 100 parts, copper 5 parts, pure gold 3 parts, zinc 10 parts, and tin 150 parts. The silver, gold, and copper are first melted and the zinc then added. A few moments afterward the tin (previously melted in another crucible) is poured in, the alloy stirred with an iron rod, and immediately poured into an ingot mold.

DEXTRINE MUSILAGE.

Four hundred parts of dextrine are stirred into four hundred parts of water; then add two hundred parts more of water, twenty parts of glucose and ten parts aluminum sulphate; heat the mixture to one hundred and ninety-five degrees Fahrenheit, when it will become thin and transparent.

A SIMPLE STORAGE BATTERY.

Journal of the Telegraph.

Get two half round porous cups and a round glass jar large enough for the two porous cups to stand in upright. Get two plates of sheet lead one-sixteenth of an inch thick, wide enough to fit the half-round side of the porous cups and deep enough to come an inch or so above the top edge of the cups and jar. Solder a

stout copper wire or a screw post to each lead plate at the top. Place the lead plates in the cups and fill the cups nearly full with a paste made of red lead mixed with a solution of sulphate of soda thin enough to run like a cement. The glass jar containing the two cups should be filled to within half an inch of top of cups with sulphuric acid and water, about one part of acid to eight parts of water. One plate should be marked X, so that, in charging, the currents will be correctly connected. This may be charged by attaching to a series of a dozen sulphate of copper cells for twenty-four hours, or from a dynamo. It should always be charged in same direction, and it will improve by repeated chargings. A wooden cover may be fitted to the glass jar, and evaporation of the fluid should be replenishsd by adding water. Two or more cells of this battery will work small motors, lamps, and induction coils, and if thoroughly charged will retain a large volume of electricity for considerable time. After once being well charged, four to six cells of sulphate of copper battery will recharge it.

OIL STONE LUBRICANT.

DR. W. H. STEELE.

Items of Interest.

For oil stones use one part glycerine and two parts alcohol. It keeps the surface clean, and sharp gritted; oil thickens by use and exposure, and gums the stone.

PLASTER CAST OF A NOSE, OR ANY EXTERNAL ORGAN.

Western Dental Journal.

This may be made as follows: Melt paraffine in a water bath, and with a soft brush paint the tissue over, laying on the first coat very quickly. Continue to add paraffine until a coating an eighth of an inch thick is obtained. This can be separated by cutting at the necessary points, and again placing the parts in contact, when the plaster cast may be made, pouring the latter in and out two or three times, to avoid air bubbles.

TESTING GOLD.

Jewelers Journal.

To test 18k. gold ordinary nitric acid will not do, as it will not affect 14 and 16 and more than 18k. Take about two ounces of C. P. nitric acid; add two drops of muriatic acid. This will not affect 18k., but will leave a brown mark on 14. The difference can be more easily seen by rubbing on the test-stone and compare with the needles, but if you have no stone and needles you can distinguish the difference by merely dropping the acid on the gold.

INTERNATIONAL DENTAL NOTATION.

British Journal Dental Science.

Report of committee appointed by the International Congress at Paris. The Commission recommended the adoption of the following system of numbering the permanent teeth:

RIGHT.

Upper.	16,	14,	12,	10,	8,	6,	4,	2,
Lower.	16,	14,	12,	10,	8,	6,	4,	2.

LEFT.

Upper.	1,	3,	5,	7,	9,	11,	13,	15,
Lower.	1,	3,	5,	7,	9,	11,	13,	15.

With regard to the temporary teeth, it was decided not to adopt the method of numbering employed in Hillischer and other systems, which is thus expressed from the median line 1, 2, 3, 6, 7, but simply to adopt the numbers 1 to 10 on the same principle as the permanent teeth, merely distinguishing the temporary tooth from its permanent successor by prefixing a decimal point in front of the numeral.

It is claimed by Hillischer and others that their system of numbering the temporary teeth avoids confusion by retaining the relative significance of the numerals of the permanent set. This claim is self-evident, so far as the incisors and canines are concerned, but not so for the temporary molars, since the gap between the numbers 3 and 6 is decidedly confusing. It was deemed, therefore, simpler and less confusing to utilize the same numbers

for the deciduous molars as were employed for their succeeding teeth, the bicuspids, and not those of their mere namesakes.

The following system of numbering the temporary teeth was adopted:

RIGHT.		LEFT.	
Upper	10, 8, 6, 4, 2.	Upper	1, 3, 5, 7, 9.
Lower	10, 8, 6, 4, 2.	Lower	1, 3, 5, 7, 9.

With regard to symbols to indicate the surfaces of the teeth, it was decided to adopt those employed in the system of notation which I have published. The only difficulty was with regard to the symbol representing the crown or masticating surfaces. This simply arose from the difficulty in finding an equivalent which would be the same in the various languages. The term "crown," or even the mere term "coronal," it was urged, is not employed in France to indicate the masticating surface. It was, therefore, determined to substitute "t" instead of "c" for the crown surface, as being the corresponding mnemonic contraction for triturating surface (F., Surface triturante; L., Superficies triturans). It was also determined that, since labial and buccal are only two different names descriptive of the same surface, only one symbol, viz: "l" for labial, should be employed; the same remark equally applies to the terms palatal and lingual, and therefore only one symbol, viz: "p," has been adopted. The symbol signifying cervical is a segment of a circle; by accentuating the curve the sign can be made to graphically indicate the extent to which the cervical margin of the tooth is involved.

The following symbols were therefore adopted for describing the surfaces of the teeth:

T., trituating (synonyms: crown, coronal.)

M., mesial.

D., distal.

L., labial (synonym: buccal.)

P., palatal (synonym: lingual.)

⌣, cervical.

By means of the first five signs and their obvious combinations, such as mesio-palatal, disto-lingual, and so on, it is easy to sufficiently define even any irregularly-disposed carious cavity, e.g., a cavity extending from the mesial over the crown to the distal

surface is sufficiently described by the letters, m.t.d. If, instead of a single compound cavity, it is desired to indicate three separate cavities on these several cavities, the use of the colon is sufficient to distinguish the difference thus—m:t:d:. The colon is always and solely employed to define the localization and the operative terms, and so prevent confusion with any adjacent symbols.

SHARPENING FILES.

DR. F. E. BUCK.

Items of Interest.

Clean them of all dirt by washing in warm potash water, then wash them in clean warm soft water, hold over a fire till dry, and be careful not to get them hot enough to injure the temper. Make a bath in a wooden vessel, as follows: Put the files in one pint of warm rain water, add 1½ ozs. of pulverized blue vitrol, 2 ozs. of borax, pulverized and well mixed; turn the files over so that all parts may come in contact with the mixture. Then add to the bath 7 ozs. sulphuric acid and ½ oz. good cider vinegar. Allow the files to remain in the bath a few minutes, when remove, dry well with blottting paper, wipe thoroughly with olive oil, wrap in porous paper and lay away till needed.

CHAPPED HANDS.

Pharmaceutical Era.

The following is a pleasant and efficacious application for chapped hands:

R	Quince seed	½ ounce.
	Water	q. s.
	Glycerine	1 fluid ounce.
	Alcohol	4 fluid ounces.

Macerate the quince seed with a pint of water for twenty-four hours, stirring frequently, strain with gentle pressure through muslin, and make up the volume to 1 pint with water; then add the glycerine and finally the alcohol containing the perfume and stir briskly.

TO PRODUCE SPRING TEMPER IN SWISS BROACHES.

To draw Swiss broaches to a spring temper they should be placed on a steel, iron, or brass plate, one-eighth of an inch in thickness and three inches square. This should be held by pliers or forceps over the flame of a spirit-lamp, and be kept continually moving over it, so as to keep the plate as uniformly heated as possible. The broaches should be watched very carefully, and when they become of a dark-blue color they should be dropped in cold water.

LOCAL ANÆSTHETIC.

FOR ABSCESSES, FELONS, ETC.

Lancet.

R Chloroformi ..... ℥ v
Ether sulphurici ..... ℥ i
Menthol ..... ℥ ss
M Sig. Use with spray.

HOW TO SPLICE ENGINE BANDS.

DR. GEORGE A. MAXFIELD.

The manner in which most of the dentists splice their bands is, to say the least, a very clumsy one. It takes considerable time to make it, it is not very strong, and never runs smoothly. The splice which I shall show is made very quickly, makes a strong, even splice, and runs smoothly; in fact, the harder you pull on the band the stronger it holds. The instrument, which I shall call a needle, used in making the splice is made of piano wire, bent in the form of a hair-pin, the free ends inserted in a wooden handle, and fastened so that they will not pull out, allowing the bow end to extend about two and one-half inches from the handle. The sides of the bow must be bent near enough together to allow it to pass easily through the center of the band.

To make the splice: Measure the exact length the band must

be when spliced, mark it, then cut off the band say seven inches longer. This extra length is taken up in the splice. A splice six inches long is stronger and runs smoother than one only four inch-

Fig. 1.

es long. Unravel about an inch of each end of the band. Take the needle and pass the bow into the band where you have marked

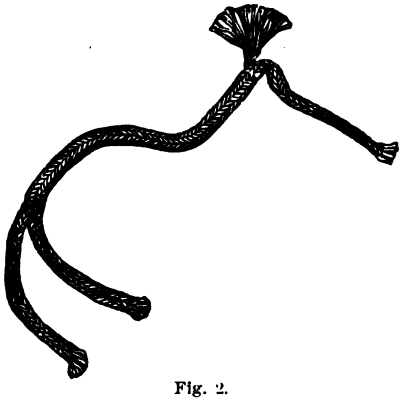


Fig. 2.

the end to be, then pass it through the centre of the band one-half of the extra length, and then out again, as at Fig. 1. Take the

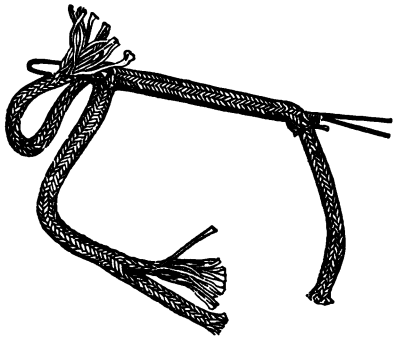


Fig. 3.

other end of the band and insert into the bow of the needle just enough to hold, and pull it through and out where the needle first entered. (See Fig 2.) Treat the other end of the band in the

same way as the first (see Fig. 3) and draw the free end through. Smooth out the splice, and cut the ends so that they will come inside of the band, and your splice is finished. If you wish to make the splice smoother, roll it between two pieces of wood. If your band has a core, it requires more painstaking in making the splice; yet it is easily done. First draw out the core from each end the length the splice is to be, say six inches, and so manipulate it as to have the ends come inside the band, exactly where the core has been cut. If you are not particular about this you will have a weak spot at each end of the splice. If you are particular in splicing this kind of a band, you will hardly be able to detect the splice after it is finished.

REMOVE INK AND RUST STAINS.

Pharm. Ztg.

Ink and rust stains are removed easily by a solution containing ten parts each of tartaric acid, alum, and distilled water. The solution has the trade name of "encrivoir."

FILING GLASS.

The Pharmaceutische Centralhalle states that glass may be filed easily and without danger of breaking by dipping the file into strong soda lye, and then, while still wet, into coarse sand.

TO CLEAN TOOLS.

Scientific American.

To clean iron parts of machinery, tools, etc., two to three cents worth of paraffine chipped fine are added to one litter of petrolium in a stoppered bottle, and during two or three days from time to time shaken up until the paraffine is dissolved. To apply it, the mixture is well shaken, spread upon the metal to be cleaned by means of a woolen rag or brush, and on the following day rubbed off with a dry woolen rag.

JEFFRY'S MARINE GLUE.

Scientific American.

India rubber, 1 part; asphaltum, 2 parts; coal tar, 12 parts.

The rubber, after having been massed, is dissolved in the undistilled coal tar, and the asphaltum is added.

DAVY'S UNIVERSAL CEMENT.

India Rubber World.

Melt 4 parts of common pitch with 4 parts of gutta-percha, in an iron vessel, mixing well. It must be kept fluid, under water, in a dry, hard state.

HEALING SALVE.

The following salve will be found a useful application for chapped lips and slight abrasions:

R Boric acid ..... 2 parts
Vaselin ..... 30 "
Glycerin ..... 3 "
M.

The above may be perfumed by the addition of a few drops of attar of roses, if intended for a lip salve.

TANNIN IN THE TREATMENT OF BURNS.

A correspondent of the Pharmateutische Zeitung, speaking from his own experience, says that tannin cannot be too highly recommended as an application to burns, especially when very extensive, the skin being entirely removed. A 5 per cent. solution is squeezed from a sponge over the denuded surface, which is then dressed with some soft ointment, either with or without tannin. Pain immediately abates, and the healing process is wonderfully rapid. The tannin solution must, of course, be freshly applied as often as the dressings are removed.

TO REMOVE COLLECTIONS ON PLATES.

Southern Dental Journal.

Plates become coated with sticky, oily, gummy debris. A little aqua amonia in the water used for cleaning them will accomplish the removal of this. The teeth should, of course, be taken out of the mouth at night.

REFINING WASTE AMALGAM.

E. W. ROCKWOOD.

International Dental Journal.

The question of the easiest and best method of refining amalgam scraps, either those which have been mixed up and not used, or old fillings, so that they can be again utilized, is of interest to every practicing dentist.

It is well known that mercury boils at 357° C., and can be driven off from amalgam by a sufficiently high heat. The other metals present are not very easily volatile, and, if they can be prevented from oxidizing, should be left in a condition to again form an amalgam on the addition of mercury. I have made some experiments in this line, and find that this result can be obtained in the following manner:

The mercury may be allowed to escape, or the process can be conducted so as to preserve it. In the former case the operation should be carried on where there is a good draught to remove the vapors of mercury so as to escape the danger from breathing them. It is only necessary to heat the scraps in a crucible until the mercury is expelled, using a flux to prevent the oxidation of the alloy. A sand crucible may be employed and a coal-fire, or any heat by which it can be raised to redness. As a flux, borax glass—borax which has been fused to drive off the water of crystallization—answers very well. The amalgam should be placed in the hot crucible in small portions so that it may not be thrown out by the sudden conversion of the mercury into vapor. Enough borax should be used to form a ring when melted around the button of alloy, and the heat must be maintained until the mass has come to a quiet fusion and globules of mercury at first seen on the walls of

the crucible have disappeared. The metal can then be poured out and the ingot reduced to the necessary fineness by any of the common methods. As a convenient means of doing this I have been accustomed to pour the mass into an unglazed porcelain mortar which has been heated so that it can hardly be held in the hand and grinding quickly with a warm pestle. By a little practice the metal can be, by this means, reduced to a fine state. The coarser particles may be sifted out by a fine wire gauze and remelted. As some of the borax will probably remain mixed with the alloy, it is advisable to boil it a few minutes in water that this may be removed if present. After drying it is ready for use.

If the mercury is to be recovered, the scraps must be heated in a mercury retort or a crucible with a bent tube inserted through the cover. The mercury will distil over through this and can be condensed where there is no possibility of breathing the vapor. When as much as possible has been removed in this way the heating should be continued a short time with the crucible open in order to expel the last traces. The residue can then be treated as described above.

OFFENSIVE ODOR OF THE BREATH,

Sanitarian.

Due to bad teeth or other causes, may be overcome, or at least greatly abated, by the habitual use of Listerine. Add a teaspoonful to a tumblerful of water for a mouth-wash and gargle, and if a little is swallowed, so much the better. Indeed, a bad breath is not unfrequently caused by the gaseous cructations of indigestion, and for this also Listerine is an excellent remedy, in doses of twenty to thirty drops in a little water.

TO PREVENT RUST.

British Journal Dental Science

To preserve your instruments from rusting, immerse them in a solution of carbonate of potash for a few minutes, and they will not rust for years, not even when exposed to a damp atmosphere.

COMPOSITION AND PROCESS FOR TEMPERING INSTRUMENTS.

DR. WILLIAM STEELE.

International Dental Journal.

Take rosin, 7½ parts; whale oil, 1½ parts; pulv. charcoal, ½ part. The instruments should be dipped in the mixture same as in water, then polish and draw the temper as usual. Small instruments should be dipped but once, larger ones two or three times. For engine and other small drills, which are wanted very hard, heat to a bright red and dip in just the drill point, and do not draw the temper. In dipping for this last work dip the point straight down, not obliquely.

IMPROVED CHIP BLOWER.

British Journal Dental Science.

To improve the common air syringe or chip blower, add a few inches of rubber tubing in place of the valve, transferring the valve to the free end of the tubing. With this change it may be depended upon to pull wind every time, and hold it.

BUFFING STEEL INSTRUMENTS.

Dental Record.

The old-fashioned method of "buffing" steel instruments is laborious and often difficult where the surfaces are inaccessible, as in the case of several patterns of excavators. The following method will be found very useful, the work being done well and rapidly: Melt two parts of mutton suet and one part of yellow wax, and whilst in a fluid state incorporate with them a sufficient quantity of flour emery to make into a thick paste. When cold apply a small quantity of the cake to an old brush mounted on the lathe mandrel and polish in the ordinary way, avoiding undue pressure where the instruments are delicate. A good surface is in this way ensured which is incomparably superior to that imparted by a buff stick.

SHELLAC SOLVENT.

A liquid that will dissolve shellac, without the aid of alcohol, and keep it in liquid form: Use saturated solution of borax in water. This will not give you a very strong solution. Wood alcohol is often used; it is about half as expensive as grain alcohol. To prevent cracking, if in alcohol, add a little castor oil; if in water, add glycerine.

FOR FETID SWEATING.

For the fetid secretion of the axilla or of the feet:

R Potassi permangantis . . 1 drachm.
Aquæ . . . . . 1 pint.

M. Sig. Apply to the parts night and morning.

LIQUID GLUE.

Dillute 2 to 2½ parts nitric acid with 40 or 50 of water. In this soak 25 parts of glue for twenty-four hours, and then heat until it is all of one consistency. The quantity of acid depends on the quality of the glue to a certain extent.

PROBES—TO MAKE.

DR. A. W. HARLAN.

Dental Review.

A very convenient, smooth-ended probe may be made from a worn-out Gates-Glidden drill. File off the end of the drill just at the beginning of the termination of the shank of the instrument, then grind it round and smooth of the proper size, and polish it. If the shank is spring-tempered, draw the temper, and it will be found quite as useful as a silver probe, with the added advantage of having a delicate handle, firm and large enough to be held easily by the hand. A probe should always be oiled or dipped in vaseline before being used.

ETCHING LIQUID.

Scientific American.

Etching liquid for steel is made by mixing 1 ounce of sulphate of copper, ¼ ounce of alum, and ½ teaspoonful of salt reduced to powder, with one gill of vinegar and 20 drops of nitric acid. This liquid may be used either for eating deeply into the metal or for imparting a beautiful frosted appearance to the surface, according to the time it is allowed to act.

CHAPPED HANDS.

For chapped hands the following formula is advised:

R Campho-phenique .....
Oil of cade ..... aa ℥ j
Rose cosmoline ..... ℥ j

M. Sig. Apply frequently.

GILDING WITHOUT A BATTERY.

According to the Jewellers' Circular, articles which do not require much handling may be quickly guilded without a battery as follows: One part of chloride of gold and four parts of cyanide of potassium are dissolved in boiling distilled water; the articles are hung in this solution, tied with a fine copper wire to a strip of zinc, scratched clean, and left in it for a few minutes.

TOOTH SOAP.

Dental Office and Laboratory.

Pure neutral castile soap is the best "body" from which to make a tooth soap. To flavor it, the soap must be melted in a water bath until reduced to the proper consistency to allow of the incorporation of the flavoring substances. The melting is accomplished by shaving the soap into thin ribbons and adding a small proportion of water. When melted, the flavoring is stirred in and

the soap poured into frames, and afterward when firmly set, cut into suitable pieces by wires. These pieces are carefully dried, and, before too firm, pressed in molds to give them a proper finish.

As there is necessarily some loss of flavor by volatilization when heat is used, the "cold process" is employed to advantage where the flavoring material is expensive. This consists in passing the soap shavings through rollers until a homogenous mass is obtained, incorporating the perfumes in the same way, beating into shape, dividing, and pressing as before. An industrious person may possibly successfully substitute a mortar for the rollers, but it is doubtful if as good results could be obtained from the former as from the latter.

Whether the cakes are obtained by the hot or cold process, it is scarcely possible to give them a finished appearance without pressure by appropriate dies.

As to flavors for tooth soap, those of a spicy character are rather preferable to those which may be distinguished as floral. Peppermint and spearmint are especially liked by many persons in tooth preparations; wintergreen is also a favorite, and cinnamon and cloves are useful in combination. The oils of these substances are of course used, and about two drams to a pound of soap will be sufficient for most tastes. We suggest the following mixture:

Oil of peppermint ..... 6 parts.
Oil of spearmint ..... 3 "
Oil of cloves ..... 1 "

This may be varied by the addition of cinnamon; the oil of red cedar wood is also a desirable flavor for dentifrices, forming with the three ingredients named in the above formula the base of the celebrated eau de botot. The oil of red cedar wood must not be confounded with the ordinary "oil of cedar" from the leaves, the latter being of a terebinthate odor. From the hints here given a few experiments should enable any one at all familiar with aromatics to secure some novel and pleasing combinations.

PUBLICATIONS.

DENTAL JOURNALS.

AMERICA—MONTHLY.

American Journal of Dental Science, Baltimore, Md., 9 West Fayette street. Editor, F. J. S. Gorgas. Publishers, Snowden & Cowman. Price $2.50.

Archives of Dentistry, St. Louis, Mo., 2602 Locust street. Editors, W. H. Eames and C. S. Stockton. Publishers, Archives Publishing Co. Price $2.00

Dental Cosmos, Philadelphia, Pa., Chestnut street, corner Twelfth. Editor, J. W. White. Publishers, S. S. White Dental Manufacturing Co. Price $2.50.

Dental Register, Cincinnati, Ohio, 117 West Fifth street. Editor, J. Taft. Publishers, Samuel A. Crocker & Co. Price $2.00.

Dental Review, Chicago, Ill., 66 Madison street. Editor, A. W. Harlan. Publisher, H. D. Justi. Price $2.50.

Dental Mirror, New York, N. Y., 121 West Twenty-eighth street. Editor, R. Ottolengui. Publishers, Dental Publishing Co. Price $1.00.

International Dental Journal, Philadelphia, Pa., 716 Filbert street. Editor, James Trueman. Publishers, International Dental Publishing Co. Price $2.50.

Items of Interest, Philadelphia, Pa., 1413 Filbert street. Editor, T. B. Welch. Publishers, Wilmington Dental Manufacturing Co. Price $1.00.

Ohio Journal of Dental Science, Toledo, Ohio, 83 Jefferson street. Editors, George Watt and L. P. Bethell. Publishers, Ransome & Randolph. Price $2.00.

Practical Dentist, Toledo, Ohio. Editor, C. W. Munson. Publisher, C. W. Munson. Price $1.00.

Southern Dental Journal, Atlanta, Ga. Editor, H. H. Johnson. Publishers, Holliday Brothers. Price $2.00.

Western Dental Journal, Kansas City, Mo., 900 Grand avenue. Editors, J. D. Patterson and H. L. Hungerford. Publishers, R. I. Pearson & Co. Price $2.00.

BI-MONTHLY.

Dental Office and Laboratory, Philadelphia, Pa., 620 Race street. Editor, Theodore F. Chupein. Publishers, Johnson & Lund. Price $1.00.

QUARTERLY.

Dental Advertiser, Buffalo, N. Y., Court and Pearl streets. Editor, Theodore G. Lewis. Publishers, Buffalo Dental Manufacturing Co. Price 50 cents.

Dental Headlight, Nashville, Tenn., 216 north Summer street. Editor, Ambrose Morrison. Publishers, Morrison Brothers. Price 50 cents.

Dental Luminary, Macon, Ga. Editors, W. R. Holmes & Mason. Publishers, W. R. Holmes & Mason. Price 50 cents.

Dominion Dental Journal, Toronto, Canada, Postoffice-box 298. Editor, George W. Beers. Publishers, Dominion Dental Journal Co. Price $1.00.

Odontographic Journal, Rochester, N. Y., 117–119 State street. Editor, J. Edward Line. Publisher, George P Davis. Price $1.00.

Texas Dental Journal, Dallas, Tex., 719 Elm street. Editor, S. Newman. Publisher, A. P. Parey. Price 50 cents.

ENGLAND—MONTHLY.

British Journal of Dental Science, London, 289-291 Regent street. Publishers, J. P. Segg & Co. Price 6d.

Dental Record, London, 6 to 10 Lexington street, Golden Square. Publishers, The Dental Manufacturing Co. Price 6d, or 7s. 6d.

Journal of the British Dental Association, London, 20 and 21 King William street, Strand. Publishers, Sallire, Lindall & Cox. Price 6d. or 7s. an.

FRANCE—MONTHLY.

L'Odontologique, Paris, 104 Rue St. Lazore. Publisher, P. Dubois. Price 10 francs an.

Le Progress Dentaire, Paris, 22 Rue 4m Septembre. Publishers, C. Ash & Sons. Price 10 francs an.

Le Monde Dentaire, Paris, 37 Rue de la Chaunce d'Antin. Publisher, Paul Vasseur. Price 3 francs an.

Revue Dentaire, Paris, 3 Rue de la Paix. Publisher, Dr. Sicard.

Revue Odontologique, Paris, 3 Rue de l'Abbaye. Publishers, L'Association de l'Ecole. Price 10 francs an.

GERMANY—WEEKLY.

Zahnarztliches Wochenblatt, Hamburg, Dr. Andreæ, Zahnart. Price 6 marks p. an.

MONTHLY.

Monatsschrift des Vereins Dentsche Zahnkunstler, Leipsig, Konigsplatz 17-11. Arthur Stolper. Price 9 marks p. an.

Dentsche Monatsschrift fur Zahnheilkunde, Leipsig, Konigastrasse 18. Arthur Felix. Price 14 marks p. an.

Journal fur Zahnheilkunde, Berlin, 4 Chausseestrasse. Erich Richter. Price 6 marks.

BI-MONTHLY.

Die Zahntechnische Reform, Berlin, Kurstrasse 18-19. M. Niethe. Price 7 marks.

QUARTERLY.

Correspondenz-blatt fur Zahnarzte, Berlin. C. Ash & Sons. Price 5 marks.

AUSTRIA—QUARTERLY.

Oesterreichisch-Ungarische Vierteljahrsschrift fur Zahnheilkunde, Vienna, l'Fleischmarkt. Julius Weiss. Price 5 marks p. an.

CUBA—MONTHLY.

El Progresso Dental, Havana, Lealtad 137.

Cronics Dental, Havana, Armagua 90.

ITALY—MONTHLY.

La Scienza Dentaria Revista Mensile, Florence.

QUARTERLY.

Giornale di Correspondenza pei Dentista, Milano.

RUSSIA—MONTHLY.

Messager Odontologique, St. Petersburg, Newsky 75.

SPAIN—MONTHLY.

Reportio Dental, Seville.

SWITZERLAND—MONTHLY.

Revue et Archives Suisses d'Odontologic, Geneva, 14 Rue du Mont-Blanc. Publisher, Prof. C. Rodard. Price 15 francs an.

BOOKS PERTAINING TO DENTISTRY,

PUBLISHED DURING THE YEAR.

A System of Oral Surgery, by James E. Garretson, A. M., M. D., D. D. S. Published by J. B. Lippincott Company, Philadelphia.

A Compend of Dental Pathology and Dental Medicine, by George W. Warren, D. D. S. Published by Blakiston, Son & Co., Philadelphia.

Artificial Crown and Bridge Work, by George Evans, D. D. S. Published by the S. S. White Dental Manufacturing Company, Philadelphia.

Descriptive Anatomy of the Human Teeth, by G. V. Black, M. D., D. D. S. Published by the Wilmington Dental Manufacturing Company, Philadelphia.

Dental Chemistry and Metallurgy, by Clifford Mitchell, M. D. Published by W. T. Keener, Chicago.

Dental Surgery for Medical Practitioners and Students, by A. W, Barrett, M. B., M. R. C. S. Published by P. Blakiston, Son & Co., Philadelphia.

Irregularities of the Teeth and Their Treatment, by Eugene S. Talbot, M. D., D. D. S. Published by P. Blakiston, Son & Co., Philadelphia.

Irregularities of the Teeth and Their Correction, by J. N. Farrar, M. D., D. D. S. Three volumes, H. Helfield, general agent. New York.

Manual of Dental Anatomy, by Charles S. Tomes, M. A., F. R. S. Published by P. Blakiston, Son & Co., Philadelphia.

Manual of Dental Surgery, by Henry Sewell, M. R. C. S., L. D. S. Published by Balliere, Tyndall & Cox, London.

Microorganisms of the Human Mouth, by W. D. Miller, D. D. S., M. D. Published by the S. S. White Dental Manufacturing Company, Philadelphia.

Practical Dental Metallurgy, by Thomas Fletcher, F. C. S. Published by Mackie & Co., Warrington, Eng.

Plastics and Plastic Fillings, by J. Foster Flagg, D. D. S., Philadelphia.

Principles and Practice of Dental Surgery by John Ashhurst, Jr., M. D. Published by Lea Brothers & Co., Philadelphia.

Students' Manual and Hand-Book For the Laboratory, by L. P. Haskell, D. D. S. Published by the Wilmington Dental Manufacturing Company, Philadelphia.

The Dental Laboratory, by Theo. F. Chupein, D. D. S. Published by Johnson & Lund, Philadelphia.

Chicago College of Dental Surgery

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Chicago College of Dental Surgery

DENTAL DEPARTMENT OF LAKE FOREST UNIVERSITY,

The Annual Winter Course of Instruction in the Chicago College of Dental Surgery will begin the last Wednesday in September and continue until the last Wednesday in March.

THE SPRING COURSE:

This Spring Course of Lectures will begin April 1, 1891—the week following Commencement Day—and terminate the 20th of the following June.

This Course of Instruction will be chiefly of a practical nature. There will be only two lectures delivered daily—beginning at 8 a. m.—thereby enabling the student to occupy the greater part of his time in actual practical work in the clinic rooms treating and filling teeth, etc., while in prosthetic dentistry he will take impressions and construct artificial dentures.

PRACTITIONER'S COURSE:

The CHICAGO COLLEGE OF DENTAL SURGERY inaugurated this course of instruction in compliance with requests from practitioners in various sections of our country. Its success is sufficient evidence that a demand exists for post-graduate training. A systematic course of didactic and clinical instruction is especially adapted to the wants of practitioners of dentistry.

This course is open to all legal practitioners, and it is available to the young graduate who wishes to acquaint himself with the practical duties of his profession, or for the older practitioners who are desirous of pursuing some special branch of dentistry, or who wish to familarize themselves with modern advances in the various departments of the profession.

The clinical staff of the infirmary will be on duty during the course, and clinics, demonstrating the most approved methods of operating, will be conducted Special attention will be given to the construction of crowns and bridge work, continuous gum work, aluminum work, etc., etc.

Superior advantages will be offered to those who feel the need of advanced or special training in the branches of practical and scientific dentistry. The regular Surgical clinic will be conducted every Tuesday at 1:30 p. m.

Each member of the class who attends the full course will receive the practitioner's certificate.

The Practitioner's Course will begin the first Monday in June and continue until June 28. **FEES FOR THE COURSE, $35.**

LETTERS OF INQUIRY SHOULD BE ADDRESSED TO

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96 STATE STREET, CHICAGO, ILLINOIS.

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JOHN D. THOMAS, D.D.S., Lecturer on Nitrous Oxide.

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SESSIONS.

The WINTER SESSION begins October 1st, 1890, and ends on May 1st.

The SPRING SESSION begins on May 2d and ends the last of June. The work of this session is entirely practical; no lectures are delivered.

EXAMINATIONS.

At the close of the first year, examinations in Chemistry and Materia Medica are held, which, if the Student fails to pass, a second examination is afforded him at the beginning of the next winter session.

The final examination is in Anatomy, Physiology, Operative Dentistry, Mechanical Dentistry and Metallurgy, Dental Pathology and Therapeutics, and Normal Histology.

Students who have attended one full term in another dental school recognized by this Faculty, will be admitted to the graduating class without examination, upon presentation of the required certificate.

Students holding a medical diploma will be admitted to the Senior Class without examination, but will be required to spend a year in the study of Practical Dentistry in the Operative and Mechanical Departments, including the regular winter's course of lectures.

Students who have attended but one course in a medical college will be required to take two winter courses in this Department.

An examination is required for entrance to the Junior year. The requirements of this examination will be a good English education.

Students who have certificates properly attested from colleges, or schools of reputable character, will be accepted without examination.

SPECIAL NOTICE.—All students entering this Department at the session of 1891-92 will be required to remain three winter sessions before they are entitled to an examination for the degree of Doctor of Dental Surgery.

EXPENSES—WINTER TERM.

Matriculation fee, $5.00; Tuition fee, first year, $100; second year, $100. Fee for Dissection, $10; Graduation fee, $30. For each additional year, $100. Catalogues or other information may be obtained from

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NEW YORK COLLEGE OF DENTISTRY.

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REGULAR SESSION LECTURES.

FRANK W. JACKSON, M.D., Lecturer upon Anesthetics.
CARL HEITZMANN, M.D., Lecturer upon Dental Histology.
F. HASBROUCK, D.D. S.,Lecturer upon Nitrous Oxide.

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Students may matriculate at any time, as the Infirmary is open for regular Students of the College to practice the entire year.

The Regular Course of Lectures will commence on Wednesday, October 1, and continue until the first of March. The Spring Course will commence about the 15th of March and continue until about the 15th of May. Three hours of each day of the week (except Saturday) are devoted to Lectures, and four hours to *Clinics* and practice at the Chair and in the Laboratory under the direction of the Demonstrators.

With increased and greatly improved accommodations in the Infirmary and Laboratory, we now offer to students most extensive and perfect practical facilities for acquiring an education

FEES,

Matriculation	$ 5.00
Course of Lectures—Winter	100.00
Course of Oral Examinations	25.00
Practical Course—Spring and Summer (Optional)	45.00
Final Examination	30.00

Board may be obtained for from $5 to $8 per week.

For further information, address

FRANK ABBOTT, M. D., Dean,
22 West Fortieth Street, New York.

ESTABLISHED 1845.

OHIO COLLEGE OF DENTAL SURGERY,

DEPARTMENT OF DENTISTRY—UNIVERSITY OF CINCINNATI.

SESSION 1890-91.

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THE FIFTY-FIFTH ANNUAL SESSION BEGINS WEDNESDAY, OCT. 1, '90.

FEES:

JUNIOR YEAR.		SENIOR YEAR.	
Matriculation,	$ 5 00	Professors' Tickets,	$75 00
Professors' Tickets,	75 00	Analytical Chemistry Ticket,	10 00
Dissecting Tickets,	10 00	Diploma Fee,	25 00

FOR FURTHER INFORMATION AND ANNOUNCEMENT, ADDRESS

H. A. SMITH, D.D.S., Dean, or H. T. SMITH, D.D.S., Secretary.

128 GARFIELD PLACE, CINCINNATI, O.

THE BALTIMORE COLLEGE OF DENTAL SURGERY.

CHARTERED BY THE LEGISLATURE OF MARYLAND IN 1839,

THE OLDEST DENTAL COLLEGE IN THE WORLD.

FACULTY:

RICHARD B. WINDER, M.D., D.D.S., Professor of Dental Surgery and Operative Dentistry.
M. WHILLDIN FOSTER, M.D., D.D.S., Professor of Therapeutics and Pathology.
WM. B. FINNEY, D.D.S., Professor of Dental Mechanism and Metallurgy.
B. HOLLY SMITH, M.D., D.D.S., Professor of Special Anatomy and Dental Materia Medica.
THOMAS S. LATIMER, M.D., Professor of Physiology.
JAMES E. LINDSAY, M.D., Professor of Chemistry.
CHARLES F. BEVAN, M.D., Clinical Professor of Oral Surgery.
J. W. CHAMBERS, M.D., Professor of Anatomy.
RICHARD GUNDRY, M.D., Professor of Materia Medica.

CLINICAL INSTRUCTORS:

CORYDON PALMER, D.D.S., Ohio.
E. PARMLY BROWN, D.D.S., N. Y.
A. L. NORTHROP, D.D.S., N. Y.
CHAS. R. BUTLER, D.D.S., Ohio.
E. L. HUNTER, D.D.S., N. C.
W. W. WALKER, D.D.S., N. Y.
T. S. WATERS, D.D.S., Md.
DAVID GENESE, D.D.S., Md.
C. M. GINGRICH, D.D.S., Md.
J. N. FARRAR, M.D., N. Y.
J. HALL MOORE, M.D., Va.
JOHN ALLEN, D.D.S., N. Y.
R. B. DONALDSON, D.D.S., D. C.
JOHN MEYER, D.D.S., N. Y.
H. A. PARR, D.D.S., N. Y.
J. EMORY SCOTT, D.D.S., Md.
E. R. RUST, D.D.S., D. C.
C. L. ALEXANDER, D.D.S., N. C.
G. M. EVANS, N. Y.
K. C. GIBSON, N. Y.

DEMONSTRATORS:

R. BAYLY WINDER, JR., Phar.G., D.D.S., Demonstrator of Operative Dentistry.
W. G. FOSTER, D.D.S., Demonstrator of Mechanical Dentistry.

ASSISTANT DEMONSTRATORS:

GEORGE E. HARDY, M.D., D.D.S.
W. W. DUMBRACCO, D.D.S.
C. A. ST. AMAND, D.D.S.
B. D. FRIEDENWALD, D.D.S.
J. W. SMITH, D.D.S.
G. MARSHALL SMITH, D.D.S.
J. E. ORRISON, D.D.S.
C. S. SEIBOLD, D.D.S.
W. S. TWILLEY, D.D.S.
A. FOLLEY BUTLER, D.D.S.
J. H. BRANHAM, M.D., Demonstrator of Anatomy.
LOUIS F. ANKRIM, M.D., Assistant Demonstrator of Anatomy.

The Baltimore College of Dental Surgery, the first and for many years the only Dental School, offers facilities for the study of Dentistry proper, such as age and experience only can give. Its immense museum, complete apparatus, large and well-arranged building, and carefully studied curriculum give to its students great advantages and opportunities both theoretical and practical, while its age gives its Diploma a dignity far out-ranking all other Colleges—a Diploma honorably represented in all civilized countries, and held by the most distinguished members of the Dental profession.

The fact that Dentistry must be practically taught is fully recognized, the College Infirmary, a most complete, large and handsome hall, being daily filled with clean and respectable patients, of a class nearly equal to those of the average dentist. This Infirmary is open all the year, students paying an entrance fee which is deducted from those of the regular succeeding course.

The session begins October 1, closing in March. A large corps of Demonstrators always present, put in actual practice the teachings of all lectures on dentistry—leaving nothing undemonstrated. All methods are fully taught, all appliances and apparatus used; the making of instruments and the most elaborate gold and continuous gum-work, and all the cases arising in ordinary practice, with many which are rarely seen, carefully demonstrated.

The College has formed an alliance with the College of Physicians and Surgeons, by which its students are privileged to attend all lectures and clinics. The patients of this medical school numbered last year over 40,000.

Graduates of the Baltimore College of Dental Surgery are required to attend but one session at the College of Physicians and Surgeons prior to presenting themselves as candidates for the degree of M.D. (See Catalogue.) In accordance with the resolution adopted by the National Association of Dental Faculties in the city of New York on the 4th of August, 1884, and which went into effect for the session of 1885 and 1886, the qualifications for entering the Junior Class are a preliminary examination in the ordinary English branches.

TERMS OF GRADUATION.—Attendance on two Winter courses of lectures in this College as equivalent to one of these we accept one course in any reputable Dental College. Graduates of Medicine who have attended one Winter Course in this College and have passed one year, inclusive of the Winter Course, in the practical work of the Infirmary and Laboratory, will be permitted to present themselves for graduation.

BENEFICIARY STUDENTS.—Each State Dental Society is privileged to send one Beneficiary Student to this College at one-half the regular tuition fees. This has been for some years an established feature of this College.

FEES—Matriculation (paid once only), **$5.00.** Tuition fees, **$100.00.** Diploma fee, **$30.00.** Dissecting fee, **$10.00.**

Students corresponding with the Dean will please be careful to give full address, and direct their letters to

PROF. R. B. WINDER, Dean,

No. 716 Park Ave., BALTIMORE, MD.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY,

Twelfth Street, between Market and Arch, corner Filbert.

THIRTY-FIFTH ANNUAL SESSION, 1890-91.

FACULTY AND AUXILIARY INSTRUCTORS.

J. EWING MEARS, A.M., M.D., Professor of Anatomy and Surgery.

C. N. PEIRCE, D.D.S., Professor of Dental Physiology, Dental Pathology and Operative Dentistry.

WILBUR F. LITCH, M.D., D.D.S., Professor of Prosthetic Dentistry, Materia Medica and Therapeutics.

HENRY LEFFMAN, M.D., D.D.S., Professor of Chemistry and Metallurgy.

ALBERT P. BRUBAKER, M.D., D.D.S., Professor of Physiology and General Pathology.

ALONZO P. BEALE, D.D.S., Lecturer and Demonstrator of Prosthetic Dentistry.
WILLIAM R. HALL, D.D.S., Lecturer on Prosthetic Dentistry.
PERCIVAL E. LODER, M.D., D.D.S., Demonstrator of Anatomy.
G. W. WARREN, D.D.S., Chief of the Clinics and Demonstrator of Operative Dentistry.
I. N. BROOMELL, D.D.S., Demonstrator of Prosthetic Dentistry.
ALEX P. LONG, D.D.S., Demonstrator of Operative Dentistry.
E. T. DAVIS, D.D.S., Demonstrator of Operative Dentistry.
WILLIAM BEAM, A.M., Demonstrator of Chemistry.
J. HOWARD GASKILL, D.D.S., Demonstrator of Prosthetic Dentistry.
A. H. SIBLEY, D.D.S., Demonstrator of Operative Dentistry.
FREDERICK R. BRUNET, D.D.S., Demonstrator of Prosthetic Dentistry.
I. V. MERSHON, D.D.S., Demonstrator of Operative Dentistry.

This College has accepted the requirements of the National Association of Dental Faculties with regard to admission and graduation of students. (See announcement for 1890-91, which can be procured from the Dean.)

THE SPRING AND FALL SESSIONS.

THE SPRING COURSE commences on the second Monday in March and continues until the first of July. Fee, $50, which will be credited upon the fee for the regular session

THE FALL COURSE will commence on Monday, September 9, and continue until the first of October, and will be free to those who matriculate for the regular session.

Attendance upon the Spring and Fall Courses will be deemed equivalent to the term of pupilage under a private preceptor.

THE REGULAR SESSION

Will commence on October first, and continue until the first of March ensuing. Twenty lectures will be delivered each week on the various branches taught.

CLINICAL PRACTICE.

Lecture hours excepted, general clinical practice is available for the student continuously through the day, ten months in the year. Competent instructors are always present.

GRADUATION IN MEDICINE.

By an arrangement with Jefferson Medical College, such students as may desire to do so can, if found qualified, obtain the two degrees, in Dentistry and Medicine, in three years. Students desiring to graduate in Medicine are required to notify the Dean of their intention at the beginning of their second course.

FEES.

Matriculation (paid but once)	$ 5.00
For the Course (Demonstrators' Ticket included)	100.00
Dissecting Fee	10.00
Diploma Fee	30.00

Board can be obtained at from $4.00 to $6.00 per week.

The Instruments and Tools required can be procured for from $35.00 to $45.00. This sum does not include the price of dental engine.

For further information, address

C. N. PEIRCE, D.D.S., Dean,

1415 Walnut St., Philadelphia.

UNIVERSITY · OF · MARYLAND,

DENTAL DEPARTMENT.

HON. SEVERN TEACKLE WALLACE, L.L.D,, Provost,

FACULTY:

FERDINAND J. S. GORGAS, M.D., D.D.S., Professor of Principles of Dental Science, Dental Surgery and Mechanism.
JAMES H. HARRIS, M.D , D.D.S , Professor of Operative and Clinical Dentistry.
FRANCIS T. MILES, M.D., Professor of Physiology.
L. McLANE TIFFANY, M.D., Clinical Professor of Oral Surgery.
J. EDWIN MICHAEL, M.D , Professor of Anatomy.
R. DORSEY COALE, Ph. D., Professor of Chemistry and Metallurgy.
I. EDMONDSON ATKINSON, M.D., Professor of Materia Medica and Therapeutics.
JOHN C. UHLER, M.D., D.D.S., Demonstrator of Mechanical Dentistry.
ISAAC H. DAVIS, M.D., D.D.S., Demonstrator of Operative Dentistry.
HERBERT HARLAN, M.D., Demonstrator of Anatomy.

TWELVE ASSISTANT DEMONSTRATORS.

The qualifications for admission and graduation are the same as in all reputable Dental Schools, and in accordance with the rules of the National Association of Dental Faculties.

The **Regular** or **Winter Session** will begin on the first day of October of each year, and will terminate about the first part of March.

The **Summer Session,** for practical instruction, will commence in March and continue until the regular session begins. Students in attendance on the summer session will have the advantage of all the daily Surgical and Medical Clinics of the University.

The fees for the Regular Session are $100, Demonstrator's fees included; Matriculation fee, $5; Diploma fee, for candidates for graduation, $30; Dissecting ticket, $10.

For Summer Session, no charge to those who attend the following Winter Session.

Beneficiary.—A Beneficiary student will be received from each State, on the recommendation of the State Dental Society on the payment of half of the tuition fees. Board can be obtained at from $3 50 to $5 per week, according to quality.

The University prize and a number of other prizes will be specified in annual catalogue.

Students desiring information and the annual catalogue will be careful to give full address and direct their letters to

F. J. S. GORGAS, M.D., D.D.S.,

Dean of the Dental Department of the University of Maryland,

845 N. EUTAW ST., BALTIMORE, MD.

COLLEGE OF DENTAL SURGERY

OF THE

UNIVERSITY OF MICHIGAN.

THE SESSION BEGINS OCTOBER FIRST AND CLOSES THE LAST WEEK IN JUNE.

An entrance examination is required of all not holding a diploma from a reputable literary or scientific institution.

Three years of study, including three courses in college, are required for graduation.

Superiorly equipped and admirably conducted anatomical, chemical, histological, physiological, pathological and bacteriological laboratories afford unusual advantages to dental students, where they are required to pursue the same studies and take the same standing as medical students, with exceptions where it is deemed desirable to present special dental features of these sciences. The entire afternoon of each day is devoted to practical dentistry, for which all desirable facilities are provided.

The expense of a college year, including, fees, board, books, etc., is about $300.

FOR FURTHER INFORMATION ADDRESS

J. TAFT, DEAN,
ANN ARBOR, MICHIGAN.

THE OLD RELIABLE

LAWRENCE'S AMALGAM.

This Amalgam has received the endorsement of thousands of the Dental profession during over forty-five years; which fact would seem to render any remarks as to its excellence superfluous.

BEWARE OF FRAUDULENT IMITATIONS, whether from so called analysis or otherwise, and remember that Lawrence's Amalgam is always put up in a white lithographed envelope, covering a brown one containing the Amalgam with Trade Mark on the lap of each, and both copyrighted.

THE S. S. WHITE DENTAL MANUFACTURING COMPANY,

CHESTNUT STREET, Corner Twelfth Street, PHILADELPHIA, PA.,

Is Sole Agent, and all communications should be addressed accordingly.

PRICES, 1 OZ. $3.00; 2 OZ. 5.50; 4 OZ. 10.00.

For Sale at all respectable Dental Depots.

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AMBROSE LAWRENCE, M. D., 109 ST. BOTOLPH ST., BOSTON, MASS.

ITEMS OF INTEREST.

A Monthly Magazine of Dental Science, Art and Literature.

T. B. WELCH, M. D., · · EDITOR.

THIS MAGAZINE has a unique history. It was commenced twelve years ago as a small, bi-monthly advertising sheet of four pages, at twenty-five cents a year; yet it speedily attained so large a circulation that with the second volume it was increased to eight pages, at fifty cents a year. At the beginning of the third year, the demands for increased space were so great it became a forty-eight page magazine, at one dollar a year. At the beginning of its twelfth volume (the present year), by the change of type and enlarged pages, it became the largest dental magazine in the world, with the largest circulation, unless we except one.

For 1891, we propose enlarging our magazine by sixteen pages, making sixty-four pages of live reading matter. The typographical appearance will be greatly improved, and will no doubt be appreciated by our readers.

Why this phenomenal growth?

1st. From the first we have aimed to make it what its name imparts, **ITEMS OF INTEREST.** Though we have had a few articles of some length in each issue, most have been short and crisp, and all have been a group of *Items of Interest* to the busy dentist. We have never inserted a single article as padding, or to fill up, but all—whether from original correspondence, or culled from contemporary journals, or editorials—have all been cut down to the smallest space that could express clearly and fully the writer's thoughts.

2d. We have never allowed personalities, local dissensions, or unprofitable controversies to occupy its pages.

3d. We have not curried for favor from the popular few, nor come down to the level of ignorant cobblers, nor coveted the money of the unprincipled charlatan, nor knowingly opened our pages to the selfish imposter.

4th. The greatest good to the masses of the profession has been our constant labor.

5th. Even in our advertisements we have tried to be truthful, and in admitting the advertisements of others we have endeavored to be so careful of their character as to make them as interesting, important and reliable as any part of our magazine. We have never allowed the consideration of money to pay for improper or deceptive advertisements.

All these assertions would have looked egotistic many years ago; but we are confident our readers have seen them all manifest in our pages.

We will quote, upon application, advertising rates in our magazine. The ***WANTS, FOR SALE, Etc.,*** column is quite a specialty, and for those who desire to buy or sell a practice, or want an assistant, or an assistant who desires a place, it is an unequaled advertising medium. Our price is 10 cents per word, initial or caption, making the price of an ordinary advertisement not over twenty-five cents for every thousand dentists reached.

The subscription price is $1.00 per year; foreign subscribers 50 cents additional to prepay postage. Subscriptions must begin with the January or December numbers.

THE WILMINGTON DENTAL MFG. CO.,

Publishers,

PHILADELPHIA. NEW YORK. CHICAGO.

PORCELAIN TEETH

WE can truthfully claim to have reached the present possibilities in the manufacture of Porcelain Teeth, in that our product combines all that is desirable or necessary, viz: Naturalness, strength to withstand hard usage, and adaptability, allowing the dentist to fit same to his cast with the least amount of trouble or work. Are these not sufficient reasons to make Our Porcelain Teeth the most satisfactory and economical to use, pleasing your patients and giving you consequently equal satisfaction? Our patterns cover all possible cases. If you have not received our new illustrated catalogue, send for a copy. It contains many illustrations—but not all—of our teeth, and a full line of dental supplies generally.

The Crescent and Genese Teeth fill their own sphere of usefulness, and are more generally called for each day. They are made with the same care and exactitude as our regular stock. Our Flat Teeth are noted for their unfailing ability to stand the blow-pipe. The prices quoted below are as low as the present price of platinum will allow us to make them.

PRICES:

	Each.	*$10 lot.*	*$25 lot.*	*$50 lot.*	*$100 lot.*
GUM TEETH, . .	$0.12½	.12	.11½	.11	.10
PLAIN, ...	.11	.10½	.10	.09½	.08½
FLAT BACK, . .	.15	.14½	.14	.13½	.12
CRESCENT, . . .	.12½	} No Quantity Rate.			
GENESE GUM, . .	.10				
GENESE PLAIN, .	.10				

THE WILMINGTON DENTAL MFG. CO.,

PHILADELPHIA. NEW YORK. CHICAGO.

Dawson's White Alloy.

It Contains the Five Essential Elements for Good Color and Edge Strength.
All Who Try and Observe, Continue to Use.

IT has now been about fourteen years since this Alloy was first placed upon the market, and the demand for it has steadily increased, until to-day it is one of the most popular and extensively used Alloys in the world.

The proof is conclusive now, that Dr. Dawson did succeed (after successive experimenting), in producing an Alloy that would make fillings acceptable in appearance, and actually remain so There is no more discoloration to this Alloy than there is to gold. What some term discoloration of gold is merely a dark deposit which forms on the surface--a little friction and it is immediately removed and cleansed. The same with this Alloy; the material *itself does not discolor*, and there is no perceptible shrinkage or change.

In all respects as reliable as gold, and makes a very sightly filling, being nearer in harmony with the tooth color than any other metal filling.

PROPERTIES PECULIAR TO THIS FILLING MATERIAL.

A Grey White Color, being more in harmony with tooth color than any other metal filling.

It is Malleable, which permits it to be malleted into fissures, crevices, interstices, and gives to it the greatest edge strength.

It is Dense, which enables it to take and retain a hard and smooth surface, thereby resisting corrosive agents.

Put up in glass stoppered bottles and furnished either as *filings* or *shavings*.

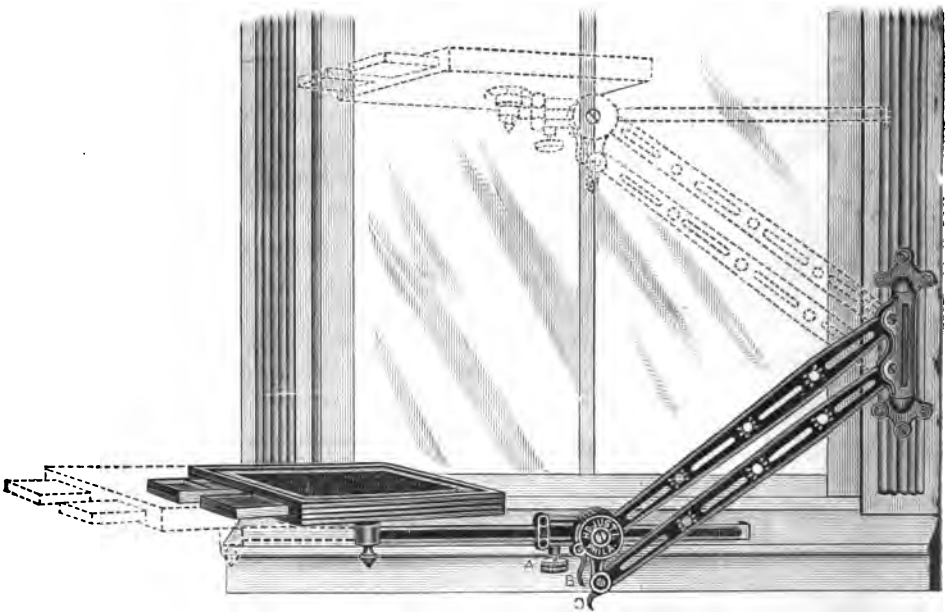
PRICES:

1	Ounce, Troy,	$ 5.00
2	Ounces, "	9.00
5	" "	20.00
10	" "	37.50

The Wilmington Dental Mfg. Co.

PHILADELPHIA. NEW YORK. CHICAGO.

THE HANDY BRACKET



SINCE the latest improvements which have been made in this Bracket and Table, we have no hesitation in saying that it is the best.

It is the best, because, though simple in construction and sold at a very moderate price, it has the full range of movements found in the most expensive and most complicated, and if by any accident a part should be broken its duplicate can be furnished at small expense.

The design and ornamentation make it a handsome addition to the operating room.

PRICE

OF BRACKET AND TABLES, AS SHOWN IN CUT.

Elegantly Japanned and Ornamented,	$12.00
With Allen Table, plain sides,	18.00
With Allen Table, beveled glass sides,	21.00

TABLES

can be obtained covered with best plush or leather, at same price.

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H. D. JUSTI,

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1301 & 1303 ARCH STREET.

CHICAGO:
NO. 66 MADISON STREET.

ARTIFICIAL TEETH.

TO those dentists who have for many years used and approved the teeth bearing the stamp of H. D. Justi, it might seem unnecessary to further advertise them, but for the information of the great number of young men who are annually entering the ranks of the Dental Profession, I wish to call attention to a few points in which I claim superiority for these teeth over all others:

In Form these will excel both in variety and in close imitation of nature, not only in her ordinary average styles, but also in what might be called her eccentricities of form and arrangement.

In Color I have succeeded in most nearly securing that bony texture which is so distinct from the porcelain-glitter we see in so many artificial teeth, and in the delicate blending of the shade they are eminently satisfactory.

In Strength they have the highest degree possible consistent with maintaining the other qualities required. It would be quite possible to make teeth much stronger by disregarding beauty of form, and making a coarse, thick block, but this ought to be, and doubtless would be, at once rejected by both dentist and patient.

In Adaptation to the alveolar ridge, great care has been taken to meet every requirement, and finally I ask for the product of my factory only a careful criticism and fair trial to convince the profession that I am fully justified in the superiority I claim for it.

H. D. JUSTI,

PHILADELPHIA. * * * CHICAGO.

CAULK'S FILLING MATERIALS.

ESTABLISHED 1877.

CAULK'S DIAMOND CEMENT.

Twenty years ago I conceived the idea of making a cement for filling teeth. I first made a study of the oral fluids and chemical effect produced by acids and alkalies on fillings in the mouth. After a long series of tabulated experiments, noting the results of the same in private practice, was evolved what has now been known for nearly **fifteen years as Caulk's Diamond Cement**, or an **Insoluble Basic Phosphate.** Its success has been almost phenomenal—as it has been in continuous use by the dental profession generally in the United States, and been exported for many years to nearly every clime upon the globe. It has held its own against all competitors throughout the world, and now stands at the head of this class of filling materials. As a **Tooth Saver** it stands unequaled. It is now regarded as a durable and permanent filling material when the proper mouths and positions are selected for its insertion.

PRICES:

Four Colors and Liquid.—Gray, Yellow, Medium and Light.....**$2.00 per pkg.**
Two Colors and Liquid.—Gray and Yellow..... 1.50 " "
One Color and Liquid.—Gray, Yellow, Medium, Light or Gum..... 1.00 " "

The Powder (any color) and Liquid of **Caulk's Diamond Cement** sold separately,
At 50 Cents Per Bottle.

CAULK'S PAR-EXCELLENCE ALLOY.

Since 1877 I have been making this **Gold** and **Platinum Alloy**, and the demand for it increases annually. My combination of metals mixed in their proper chemical relations, and the various manipulations being conducted on scientific principles, gives a product for filling teeth that stands unrivaled. Its color is good, edge strength excellent, and for density and malleability it is unsurpassed.

PRICE: { **In one-third, one-half and one-ounce envelopes, per Ounce, $3.00. Two Ounces for $5.00. Five Ounces, put up in Decorated Metal Flask, with screw top, for $11.00.**

CAULK'S WHITE ALLOY.

This **Alloy** is of a peculiar Grayish-White color, has good edge-strength, and will stand mastication anywhere in the mouth. The **best endorsement** of it is the large amount sold during the past **ten years** and the **daily increasing** demand.

PRICE: { **In one-fourth, one-half and one-ounce envelopes, per Ounce, $4.00. Two Ounces for $7.00. Five Ounces for $15.00.**

CAULK'S DIAMOND POINT STOPPING AND GUTTA-PERCHA POINTS FOR FILLING ROOTS.

Gutta Percha Points or Cones are made in Graduated Sizes. They originated with me over **ten years** ago, and are prepared expressly for filling roots.

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ALL OF CAULK'S FILLING MATERIALS ARE SOLD BY TROY WEIGHT AND SENT BY MAIL.

Over 15,000 Dentists are using these Materials throughout the World.
What better evidence do you wish of their Superiority and Excellence?

A Pamphlet of 20 pages sent upon Application.

L. D. CAULK, Manufacturer,

CAMDEN, DELAWARE, U. S. A.

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(Successors to W. VALLEAU, Jr.)

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NEW YORK,

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SOFT GOLD FOIL.

COHESIVE GOLD FOIL.

SOFT AND COHESIVE

GOLD CYLINDERS

Extra Dry Alloy and Improved Amalgam.

ESTABLISHED 1849.

THE SNOW & LEWIS

Automatic Plugger

No. 4.

THE IMMEDIATE SUCCESS of the SNOW & LEWIS DOUBLE-ACTION AUTOMATIC PLUGGER suggested the adoption of the same mechanism for a direct-action plugger. The outward form of the instrument has been changed to better accommodate the fingers. The size of the case remains the same, as twenty-five years' experience has demonstrated that a plugger with a small case and a small hammer, actuated by a stiff spring, gives a short, jerky, undesirable blow; while one with a large case, containing a large hammer, propelled by an elastic spring, delivers a blow nearly resembling that of a hand mallet.

The shank or tool-holder in the No. 4 extends through the entire length of the instrument, the upper or top end of the shank being supported by a milled cap. This not only gives a steadiness to the tool-holder, but ensures all the parts being in line, in any position the instrument may be placed.

WE BELIEVE the No. 4 AUTOMATIC PLUGGER is the smoothest-working and best Plugger ever made.

Mechanically it is the best automatic plugger ever placed on the market.

PRICE:

Snow & Lewis Automatic Plugger No. 4, nickel or silver plated, $8.00

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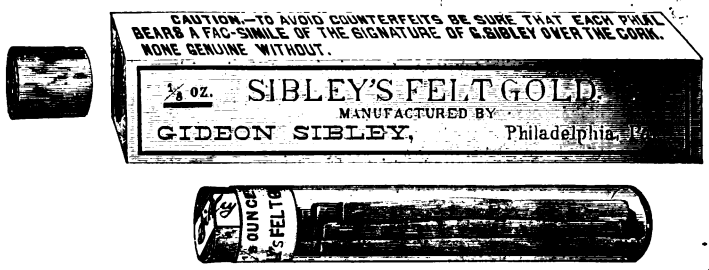
THE BUFFALO DENTAL MANUFACTURING CO.

BUFFALO, N. Y., U. S. A.

Send for New Catalogue of ***DENTISTS' SPECIALTIES,*** and New ***AUTOMATIC PLUGGER*** Catalogue.

SIBLEY'S ✻ FELT ✻ GOLD.


CAUTION.—TO AVOID COUNTERFEITS BE SURE THAT EACH PHIAL BEARS A FAC-SIMILE OF THE SIGNATURE OF G. SIBLEY OVER THE CORK. NONE GENUINE WITHOUT.
⅛ oz. SIBLEY'S FELT GOLD.
MANUFACTURED BY
GIDEON SIBLEY, Philadelphia, Pa.
⅛ OUNCE
FELT G

THIS NEW FORM OF GOLD has been before the Profession about two years, with encouraging results. From the day it was first introduced its sale has gradually increased. It is now considered the *LEADING GOLD* in the market.

Its process of manufacture is entirely new and under the supervision of a thoroughly competent chemist. The following claims I make for this *GOLD* which will not be found in any other, viz: It enables the operator to work more rapidly and with greater ease; conforms to the walls of the cavity; thoroughly cohesive and homogeneous; makes a perfect union; very dense. Is *ABSOLUTELY PURE*.

IN COLOR IT RESEMBLES FROSTED GOLD.

Annealing unnecessary unless exposed to moisture.

Directions, which are short and concise, if followed mean success; failure impossible. It has been used in certain fillings where others have proved a failure.

Full directions for use accompany each package.

That the Profession may have an opportunity to test this Gold, without buying the usual minimum package, for a short time I will put up packages containing 1-40 of an ounce; price, $1.00.

PRICES OF GOLD AS FOLLOWS:

¼ ounce, . . $4.50 | ½ ounce, . . $17.50 | 1 ounce, . . $34.00

CAUTION.—See that a fac-simile of my Signature is over the cork of each phial; none genuine without.

CASH MUST ACCOMPANY ALL ORDERS FOR GOLD.

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GIDEON SIBLEY,

DENTAL DEPOT,

SIBLEY BUILDING, 1214 TO 1220 FILBERT STREET, . . PHILADELPHIA, PA.

SNOWDEN & COWMAN'S

New Patent Vulcanizer.

PRICE:

Complete for Kerosene or Gas, with Two Large Malleable Iron Flasks, $18.00

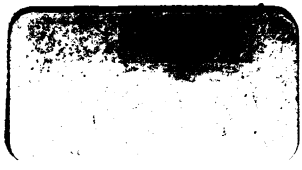
MANUFACTURED AND FOR SALE BY

SNOWDEN & COWMAN,

9 WEST FAYETTE STREET, - - BALTIMORE, MD.

Circulars Furnished on Application.

1 gal
206



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